

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

FOR THE
CHOCOLATE MOUNTAIN AERIAL
GUNNERY RANGE, CALIFORNIA

Prepared by:



Marine Corps Air Station Yuma
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and



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January 2023



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PREPARED BY:

MARINE CORPS AIR STATION YUMA
YUMA, ARIZONA

AND

NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND SOUTHWEST
CENTRAL INTEGRATED PRODUCT TEAM
SAN DIEGO, CALIFORNIA

WITH TECHNICAL ASSISTANCE FROM:

VERNADERO GROUP, INCORPORATED
SAN DIEGO, CALIFORNIA

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**INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
FOR THE CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE, CALIFORNIA**

APPROVING AGENCY

This Integrated Natural Resources Management Plan for the Chocolate Mountain Aerial Gunnery Range was prepared by Marine Corps Air Station Yuma, Arizona, with technical assistance from the United States (U.S.) Department of the Navy Naval Facilities Engineering Systems Command Southwest. This plan is prepared in cooperation with the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife in accordance with the *2013 Memorandum of Understanding for a Cooperative Integrated Natural Resources Management Program on Military Installations* (U.S. Department of Defense, U.S. Fish and Wildlife Service, and Association of Fish and Wildlife Agencies 2013).

Sikes Act Improvement Act (16 UNITED STATES CODE 670a)

This Integrated Natural Resources Management Plan is consistent with the use of military installations to ensure the preparedness of the Armed Forces and fulfills the requirements of the Sikes Act Improvement Act, as amended through 2003 (16 United States Code Section 670a, *et seq.*), for the Chocolate Mountain Aerial Gunnery Range.

Signature on this Integrated Natural Resources Management Plan constitutes a commitment to seek funding and execute, subject to the availability of funding, all "must fund" projects and activities in accordance with the timeframes identified (MCO 5090.2 – V11 [HQMC 2018]).

Approving Official: U.S. Marine Corps, Marine Corps Air Station Yuma



COLONEL CHARLES E. DUDIK
Commanding Officer
Marine Corps Air Station Yuma, Arizona

26 May 23
Date

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CONCURRING AGENCY

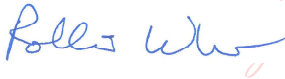
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Concurring Agency: U.S. Fish and Wildlife Service

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Field Supervisor

Carlsbad Fish and Wildlife Service Office

Date

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Concurring Agency: California Department of Fish and Wildlife

DocuSigned by:

Heidi Calvert

2/27/2023

HEIDI CALVERT

Date

Regional Manager

California Department of Fish and Wildlife

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EXECUTIVE SUMMARY

The Chocolate Mountain Aerial Gunnery Range (CMAGR) is a United States (U.S.) Marine Corps Range that has served as a military training facility since 1942. The CMAGR is located in Imperial and Riverside counties in the southeast corner of California and east of the Salton Sea. Historically, the CMAGR consisted of approximately 460,349 acres of rugged desert terrain. This terrain included about 229,903 acres of federal land administered by the Department of the Navy (DoN), about 230,284 acres of withdrawn federal public land administered by the Bureau of Land Management (BLM), and about 162 acres of land not withdrawn but administered by the Bureau of Reclamation (BOR).

In April 2013, the DoN published the *Final Legislative Environmental Impact Statement for the Renewal of the Chocolate Mountain Aerial Gunnery Range Land Withdrawal* requesting that Congress renew the California Military Lands Withdrawal and Overflights Act of 1994, which was set to expire on 31 October 2014. On 26 December 2013, President Barack Obama signed the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2014. Title XXIX, Subtitle E, of the FY 2014 NDAA directed the BLM to transfer the administrative jurisdiction of approximately 228,324 acres of land previously withdrawn in support of the military operations on the CMAGR to the DoN. The northwest boundary was realigned to the edge of the Bradshaw Trail, so the trail is now entirely on public land under the jurisdiction of the BLM. The DoN relinquished 629 acres of DoN land and 1,960 acres of BLM public land withdrawn for military use that is located immediately north of the Bradshaw Trail, and BLM will manage the land in accordance with the applicable Land Use Plan developed under Section 202 of the Federal Land Policy and Management Act of 1976, Title 43 United States Code (U.S.C.) Section 1712. Post-NDAA acreage of the CMAGR is approximately 457,760.

Because military lands often contain significant natural resources, Congress enacted the Sikes Act in 1960 (16 U.S.C. 670-670f) to address wildlife conservation and public access on military installations. The Sikes Act Improvement Act (Sikes Act), as amended, requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations in cooperation with the U.S. Fish and Wildlife Service (USFWS) and state fish and wildlife agencies. The 1997 amendments to the Sikes Act require the Department of Defense (DoD) to develop and implement an Integrated Natural Resources Management Plan (INRMP) for each military installation with significant natural resources. The FY14 NDAA also mandates that the DoN, in coordination with the BLM, prepare an INRMP for the newly configured and administered CMAGR. This updated INRMP has been prepared in cooperation with the USFWS and California Department of Fish and Wildlife, in coordination with the BLM and BOR, and it reflects a mutual agreement of the signatory parties concerning conservation, protection, and management of fish and wildlife resources on the CMAGR.

This INRMP is a living document that will be reviewed annually and periodically updated to provide for the proper and sustainable management of natural resources on the CMAGR. This version presents new and updated information since the initiation of the CMAGR INRMP of 2017. Approximately every five years, an INRMP is reviewed for operation and effect and to determine if an update or revision is required. During this review of the 2017 CMAGR INRMP, it

was determined that an update was required to include minor edits due to new findings and adjusting management measures as practical to conserve natural resources while maintaining the military mission with no net loss to training.

The goal of ecosystem management, as established by the DoD, is to ensure that military lands support present and future training requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, this approach maintains and improves the sustainability and biological diversity of terrestrial and aquatic ecosystems while supporting sustainable economies, human use, and the environment required for realistic training operations. To ensure frequent and continued use of land for military training now and in the future, management programs and actions in this INRMP prescribe natural resource conservation/management on the CMAGR that is: 1) sustainable; 2) in accordance with laws and regulations; and 3) integrated with existing military installation plans and mission requirements. This INRMP will ensure that lands remain available and in good condition to support the CMAGR's military mission with "no net loss" of military training capability.

This INRMP provides a brief summary of the CMAGR's history and current land uses, natural resources, natural resource management programs, and their goals and objectives. Also developed is a list of actions planned for the next five years to implement this INRMP including a timeframe that outlines each project activity and how often it will occur (Table ES-1). Actions are listed by program area and include priority classification, frequency, and legal drivers.

Table ES-1. CMAGR INRMP 5-Year Action Plan: FY23-28

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
INRMP Implementation	4.1-1: Prioritize, pursue funding opportunities, and implement projects as outlined in this INRMP.	23-28	3	Annual	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO 5090.2 – V11
	4.1-2: Review the INRMP annually for Operation and Effect.	23-28	3	Annual	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO 5090.2 – V11
NEPA Review	4.2-1: Provide expert review of potential impacts of federal actions on the CMAGR.	23-28	3	Ongoing	NEPA of 1969 (42 U.S.C. 4321–4370h; 40 CFR Parts 1500–1508), DoDI 4715.03 and MCO 5090.2 – V11
ESA Compliance	4.3-1: Adhere to conservation measures and relevant avoidance measures identified in all applicable USFWS BOs (see Appendix E in the INRMP for all applicable BOs).	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, MCO 5090.2 – V11, and 1996 USFWS BO
	4.3-2: Manage federally listed threatened or endangered species and their habitats to prevent jeopardy to the species and to assist in their conservation and recovery.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO 5090.2 – V11
	4.3-3: Manage federally listed threatened or endangered species and their habitats in a manner that minimizes impacts to both mission and species.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO 5090.2 – V11

FY – fiscal year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **U.S.C.** – United States Code; **DoDI** – DoD Instruction; **MCO** - Marine Corps Order; **NEPA** – National Environmental Policy Act; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **CFR** – Code of Federal Regulations; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **GIS** – geographic information system; **FWCA** - Fish and Wildlife Conservation Act; **MBTA** – Migratory Bird Treaty Act; **BGEPA** – Bald and Golden Eagle Protection Act; **EO** - Executive Order; **BASH** – Bird Aircraft Strike Hazard; **MCAS** – Marine Corps Air Station; **StaO** – Station Order; **BLM** – Bureau of Land Management; **DoD** – Department of Defense

Table ES-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.3-4: Proactively collect information on presence or absence, location, habitat availability and suitability, and life history requirements of federally listed threatened or endangered species and maintain and update these data.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO 5090.2 – V11
	4.3-5: Develop and maintain a robust GIS database that will be updated as survey data become available, to document spatial and temporal distribution of federally listed threatened or endangered species.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO 11000.25, Installation Geospatial Information and Services
Threatened or Endangered Species, Critical Habitat	4.4-1: Continue participation in annual desert tortoise surveys in support of inventory, monitoring, and mapping efforts.	23-28	3	Annual	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, MCO 5090.2 – V11, and 1996 USFWS BO
	4.4-2: Map desert tortoise population, densities, habitat parameters, and threats across the range.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, MCO 5090.2 – V11, and 1996 USFWS BO
	4.4-3: Continue to participate in the Desert Tortoise Management Oversight Group and the California Recovery Implementation Team. Develop project proposals to assist with the species recovery.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, MCO 5090.2 – V11, and 1996 USFWS BO

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Table ES-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.4-4: Pending decisions of other state and federal lead agencies, determine whether the reintroduction of a nonessential experimental population of Sonoran pronghorn will be compatible with training mission objectives and designed to avoid conflicting with range operations.	23	2	One time	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO 5090.2 – V11
	4.4-5: Assist in coordination and provide in-kind and financial support, if available, to the Sonoran pronghorn recovery team.	23-28	2	Varies	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO 5090.2 – V11
Other Special Status Species	4.5-1: Inventory and monitor special status species to establish a baseline from which conservation and management strategies can be devised.	23-28	2	Ongoing	FWCA of 1980 (16 U.S.C. 2901 <i>et seq.</i>), DoDI 4715.03, and MCO 5090.2 – V11
Migratory Birds and Eagles	4.6-1: Avoid or minimize impacts to migratory birds and eagles and their habitat.	23-28	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO 5090.2 – V11
	4.6-2: Conduct presence/absence surveys periodically as part of an adaptive management strategy to better inform migratory bird management on the range.	23-28	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO 5090.2 – V11

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Table ES-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.6-3: Develop, implement, and evaluate conservation measures for management actions to avoid or minimize incidental take of migratory birds and eagles.	23-28	2	One time	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO 5090.2 – V11
	4.6-4: Participate in regional or national inventory and monitoring programs.	23-28	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO 5090.2 – V11
BASH Program	4.7-1: Maintain the existing MBTA depredation permit(s).	23-28	3	Annual	MBTA of 1918, MCO 5090.2 – V11, and MCAS Yuma StaO 3750.1B
	4.7-2: Update as necessary and periodically evaluate possible improvements to this successful program that might further reduce BASH incidents.	23-28	3	Varies	MCO 5090.2 – V11 and MCAS Yuma StaO 3750.1B
General Wildlife	4.8-1: Inventory and monitor distribution and abundance of reptiles, birds, amphibians, and small mammals.	23-28	2	Ongoing	FWCA of 1980 (16 U.S.C. 2901 <i>et seq.</i>), DoDI 4715.03, and MCO 5090.2 – V11
	4.8-2: Maintain vegetation known to support wildlife.	23-28	2	Ongoing	DoDI 4715.03 and MCO 5090.2 – V11

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Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.8-3: Restore or enhance vegetation outside of heavy-use areas.	23-28	2	Ongoing	DoDI 4715.03 and MCO 5090.2 – V11
Nonnative and Nuisance Wildlife	4.9-1: Work in partnership with the BLM to control the wild burro populations.	23-28	2	Ongoing	DoDI 4715.03, MCO 5090.2 – V11, EO 11987 - Exotic Organisms and EO 13112 - Invasive Species
	4.9-2: Inventory, monitor and control raven populations.	23-28	2	Ongoing	DoDI 4715.03, MCO 5090.2 – V11, EO 11987 - Exotic Organisms and EO 13112 - Invasive Species
	4.9-3: Develop pest species management programs as needed to include pest mammals such as rabbits, skunks, raccoons, squirrels, coyotes, feral dogs, feral cats, and pest birds.	23-28	2	Ongoing	DoDI 4715.03, DoDI 4150.07, MCO 5090.2 – V11, EO 11987 - Exotic Organisms and EO 13112 - Invasive Species
Vegetation	4.10-1: Complete vegetation mapping.	23-28	2	Ongoing	DoDI 4715.03, MCO 5090.2 – V11, and MCO 11000.25, Installation Geospatial Information and Services
	4.10-2: Identify essential habitats for rare plants and wildlife.	23-28	2	Varies	DoDI 4715.03 and MCO 5090.2 – V11
Invasive and Nonnative Plant Species	4.11-1: Acquire reliable baseline data on the presence and abundance of invasive and nonnative plant species.	23-28	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 <i>et seq.</i>); DoDI 4715.03; DoDI 4150.07; MCO 5090.2 – V11; EO 11987 - Exotic Organisms; and EO 13112 - Invasive Species

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Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.11-2: Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness.	23-28	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 <i>et seq.</i>); DoDI 4715.03; DoDI 4150.07; MCO 5090.2 – V11; EO 11987 - Exotic Organisms; and EO 13112 - Invasive Species
	4.11-3: Treat and monitor areas most likely to impact ecosystem health or mission readiness.	23-28	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 <i>et seq.</i>); DoDI 4715.03; DoDI 4150.07; MCO 5090.2 – V11; EO 11987 - Exotic Organisms; and EO 13112 - Invasive Species
Wildland Fire Management	4.12-1: Implement the Wildland Fire Management Plan.	23-28	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, DoDI 6055.06, and MCO 5090.2A
Wildlife Watering Sources	4.13-1: Maintain access to the guzzlers along the Coachella Canal to allow large mammals to move onto and off the CMAGR to use these guzzlers.	23-28	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO 5090.2 – V11
Ecosystem Management	4.14-1: Support research to gain the best available scientific information to guide natural resource and conservation decisions.	23-28	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO 5090.2 – V11
	4.14-2: Define and understand CMAGR's regional relevance and responsibility towards regional conservation efforts.	23-28	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO 5090.2 – V11

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Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.14-3: Update aerial orthographic photographs over time to determine a baseline and to document landscape changes.	25	2	Once per 5 years	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO 5090.2 – V11
	4.14-4: Utilize aerial orthographic imagery to conduct anthropogenic-impact-specific studies.	26	2	Once per 5 years	MCO 5090.2 – V11, MCO 11000.25 Installation Geospatial Information and Services
Soils	4.15-1: Establish a soils and erosion monitoring framework to measure and assess changes to soil resources over time.	23-28	2	Ongoing	Soil Conservation Act (16 U.S.C. 590a <i>et seq.</i>), DoDI 4715.03, and MCO 5090.2 – V11
	4.15-2: Assess current erosion status within the watershed and evaluate possible engineering management practices that will mitigate erosion.	23-28	2	Ongoing	Soil Conservation Act (16 U.S.C. 590a <i>et seq.</i>), DoDI 4715.03, and MCO 5090.2 – V11
	4.15-3: Develop spatial data related to soil associations and characteristics.	23-28	2	Ongoing	Soil Conservation Act (16 U.S.C. 590a <i>et seq.</i>), DoDI 4715.03, and MCO 5090.2 – V11
Climate Change	4.16-1: Conduct an assessment of sustainability objectives and strategies in the context of climate change relevant to natural resources on the CMAGR.	23-28	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap

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Table ES-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.16-2: Conduct vulnerability assessments of species and habitats most at risk, coordinating with other DoD installations for guidance.	23-28	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
	4.16-3: Collaborate with DoD mission leads, wildlife agencies, and other relevant partners to optimize the value of strategies developed for adaptation to climate change.	23-28	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
	4.16-4: Install and maintain weather stations, including rain gauges at specific study locations.	23-28	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
Conservation Program GIS	4.18-1: Continue development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils.	23-28	2	Ongoing	DoDI 4715.03 and MCO 11000.25 Installation Geospatial Information and Services
Cooperative Initiatives	4.19-1: Cooperate with internal stakeholders (i.e., Environmental, Installations and Logistics, and Planning), cooperating agencies, and external stakeholders on natural resource management issues of mutual interest.	23-28	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO 5090.2 – V11

FY – fiscal year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **U.S.C.** – United States Code; **DoDI** – DoD Instruction; **MCO** - Marine Corps Order; **NEPA** – National Environmental Policy Act; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **CFR** – Code of Federal Regulations; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **GIS** – geographic information system; **FWCA** - Fish and Wildlife Conservation Act; **MBTA** – Migratory Bird Treaty Act; **BGEPA** – Bald and Golden Eagle Protection Act; **EO** - Executive Order; **BASH** – Bird Aircraft Strike Hazard; **MCAS** – Marine Corps Air Station; **StaO** – Station Order; **BLM** – Bureau of Land Management; **DoD** – Department of Defense

Table ES-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
Law Enforcement	4.21-1: Establish and maintain adequate control measures (signs, gates, fences, etc.) to provide for security, safety, and protection of natural resources.	23-28	3	Ongoing	Sikes Act (16 U.S.C. 670), Assimilative Crimes Act (18 U.S.C. 13), Uniformed Code of Military Justice (10 U.S.C. 807B)

FY – fiscal year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **U.S.C.** – United States Code; **DoDI** – DoD Instruction; **MCO** - Marine Corps Order; **NEPA** – National Environmental Policy Act; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **CFR** – Code of Federal Regulations; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **GIS** – geographic information system; **FWCA** - Fish and Wildlife Conservation Act; **MBTA** – Migratory Bird Treaty Act; **BGEPA** – Bald and Golden Eagle Protection Act; **EO** - Executive Order; **BASH** – Bird Aircraft Strike Hazard; **MCAS** – Marine Corps Air Station; **StaO** – Station Order; **BLM** – Bureau of Land Management; **DoD** – Department of Defense

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	Celsius
°F	Fahrenheit
ACEC	Area of Critical Environmental Concern
ATCAA	Air Traffic Control Assigned Air Space
BASH	Bird/Animal Aircraft Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
BLM	Bureau of Land Management
BMGR	Barry M. Goldwater Range
BO	Biological Opinion
BOR	Bureau of Reclamation
BSTRC	Bob Stump Training Range Complex
CAAQS	California Ambient Air Quality Standards
Cal-IPC	California Invasive Plant Council
CDCA	California Desert Conservation Area
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDWR	California Department of Water Resources
CFR	Code of Federal Regulations
CH ₄	Methane
CMAGR	Chocolate Mountain Aerial Gunnery Range
CMBC	Circle Mountain Biological Consultants, Inc.
CMLWOA	California Military Lands Withdrawal and Overflights Act of 1994
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COLS	Common Output Level Standards
CRPR	California Rare Plant Rank
CVMSHCP	Coachella Valley Multiple Species Habitat Conservation Plan
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoI	Department of the Interior
DoN	Department of the Navy

DRECP	Desert Renewable Energy Conservation Plan
DTC	Desert Training Center
DTC/C-AMA	Desert Training Center California – Arizona Maneuver Area
DTRO	Desert Tortoise Recovery Office
DWMA	Desert Wildlife Management Area
EA	Environmental Assessment
ECE	Environmental Compliance Evaluation
ECR	El Centro Ranges
EIS	Environmental Impact Statement
EOD	Explosive Ordnance Disposal
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FARP	Forward Arming and Refueling Point
FCR	Field Contact Representative
FLPMA	Federal Lands Policy and Management Act
FLTFA	Federal Land Transaction Facilitation Act
FONSI	Finding of No Significant Impact
FR	Federal Register
FY	Fiscal Year
FYDP	Future Years Defense Program
GIS	Geographic Information System
GPS	Global Positioning System
GSRC	Gulf South Research Corporation
HMA	Herd Management Area
HQMC	Marine Corps Headquarters
INRMP	Integrated Natural Resources Management Plan
ISDRA	Imperial Sand Dunes Recreational Area
LEIS	Legislative Environmental Impact Statement for the Renewal of the Chocolate Mountain Aerial Gunnery Range Land Withdrawal
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
MCIWest	Marine Corps Installations West
MCO	Marine Corps Order
MOA	Military Operations Area
MOU	Memorandum of Understanding

N ₂ O	Nitrous Oxide
NAVFAC SW	Naval Facilities Engineering Systems Command Southwest
NAAQS	National Ambient Air Quality Standards
NDAA	National Defense Authorization Act
NECO	Northern and Eastern Colorado Desert Coordinated Management Plan
NEPA	National Environmental Policy Act
NEP	Nonessential Experimental Population
NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen
NRCS	Natural Resources Conservation Service
NSW	Naval Special Warfare
O ₃	Ozone
OHV	Off-Highway Vehicle
Pb	Lead
PM _{2.5}	Fine Particulate Matter Less Than or Equal to 2.5 Microns in Diameter
PM ₁₀	Suspended Particulate Matter Less Than or Equal to 10 Microns in Diameter
REEA	West Chocolate Mountains Renewable Energy Evaluation Area
ROI	Region of Influence
SCAG	Southern California Association of Governments
SEAL	Sea, Air and Land
Sikes Act	Sikes Act Improvement Act, as amended through 2003 (16 United States Code 670a, <i>et seq.</i>)
SO ₂	Sulfur Dioxide
StaO	Station Order
STATSGO2	State Soil Geographic Database
SWAT	Special Warfare Training Area
TMR	Tortoise Management Representative
UPRR	Union Pacific Railroad
U.S.	United States
USAF	United States Air Force
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USMC	United States Marine Corps
VegCAMP	Vegetation Classification and Mapping Program

Vernadero	Vernadero Group, Incorporated
WECO	Western Colorado Desert Routes of Travel Designations
WFMP	Wildland Fire Management Plan
WWII	World War II

1.0 INTRODUCTION

The Chocolate Mountain Aerial Gunnery Range (CMAGR) has served as a military training range since 1942. The CMAGR is located in Imperial and Riverside counties within the southeastern corner of California, east of the Salton Sea and west of the California/Arizona border. Historically, the CMAGR consisted of approximately 460,349 acres of rugged desert terrain. This terrain included about 229,903 acres of federal land administered by the Department of the Navy (DoN), about 230,284 acres of withdrawn federal public land administered by the Bureau of Land Management (BLM), and about 162 acres of land not withdrawn but administered by the Bureau of Reclamation (BOR).

The training range, which is a component of the national defense training infrastructure, is indispensable to the continued and future readiness of DoN and United States Marine Corps (USMC) air and ground forces, including Naval Special Warfare (NSW) Sea, Air and Land (SEAL) units. The need for quality training that provides a realistic approximation of the conditions that Marines, Sailors, Airmen, and Soldiers will face in combat as individuals and in small or large units cannot be overstated. The United States (U.S.) military is fully invested in the principle that high-quality training is essential to success and survival in combat. Access to ranges that offer flexible, diverse, and realistic training is essential to preparing tactical forces of the highest possible quality. Thus, the necessity of keeping the CMAGR fully in service can best be understood from two main perspectives: (1) the necessity of providing high-quality training and (2) the superlative qualities of the CMAGR for supporting that training.

In April 2013, the DoN published the *Final Legislative Environmental Impact Statement for the Renewal of the Chocolate Mountain Aerial Gunnery Range Land Withdrawal* (LEIS) requesting that Congress renew the California Military Lands Withdrawal and Overflights Act of 1993 (CMLWOA), which was set to expire on 31 October 2014 (DoN et al. 2013). This included the withdrawal, reservation, and transfer of public lands in support of military readiness and security for the DoN and the U.S. Army. Title XXIX of the act established general provisions with respect to military land withdrawals as well as specific obligations and authorities for the CMAGR, which is managed by the Marine Corps Air Station (MCAS) Yuma, Arizona, as part of the Bob Stump Training Range Complex (BSTRC). Subtitle E of Title XXIX required the transfer of 228,324 acres of withdrawn land within the CMAGR from the administrative jurisdiction of the Department of the Interior (DoI) to the DoN. The BOR retained administrative jurisdiction of its 162 acres within the CMAGR because that land was not withdrawn for military purposes.

On 26 December 2013, President Barack Obama signed the National Defense Authorization Act for Fiscal Year 2014 (FY14 NDAA). Title XXIX, Subtitle E, of the FY14 NDAA directed the BLM to transfer administrative jurisdiction to the DoN for approximately 228,324 acres of land previously withdrawn in support of the military operations on the CMAGR. The northwest boundary was realigned to the edge of the Bradshaw Trail; therefore, the trail is entirely on public land under the jurisdiction of the BLM. The DoN relinquished 629 acres of DoN land and 1,960 acres of BLM land, withdrawn for military use, that are immediately north of the Bradshaw Trail to the BLM. The BLM will manage the land in accordance with the applicable Land Use Plan developed under Section 202 of the Federal Land Policy and Management Act of 1976 (FLPMA), Title 43 United States Code (U.S.C.) 1712.

The FY14 NDAA also mandated the DoN, in coordination with the BLM, prepare an Integrated Natural Resources Management Plan (INRMP). The 2014 CMAGR INRMP was revised to satisfy this requirement. Figure 1-1 shows the previous CMAGR boundary and Figure 1-2 shows the current boundary approved by Congress.

Because military lands often contain significant natural resources, Congress enacted the Sikes Act in 1960 to address wildlife conservation and public access on military installations. The Sikes Act Improvement Act (Sikes Act), as amended through 2003 (16 U.S.C. 670-670f), requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations in cooperation with the U.S. Fish and Wildlife Service (USFWS) and state fish and wildlife agencies, specifically the California Department of Fish and Wildlife (CDFW). The 1997 amendments to the Sikes Act require the Department of Defense (DoD) to develop and implement an INRMP for each military installation with significant natural resources. This INRMP was prepared in cooperation with both the USFWS and the CDFW, in coordination with the BLM and BOR, and reflects a mutual agreement of these parties concerning the conservation, protection, and management of natural resources on the CMAGR.

This INRMP will provide for the management of natural resources of the CMAGR. It continues to incorporate, to the maximum extent practicable, ecosystem management principles and adaptive strategies and provides the landscape necessary for the sustainment of military land uses. This INRMP is intended to guide the effective management of the Installation's natural resources, ensuring its lands remain available and in good condition to support the CMAGR's military mission with "no net loss" of military training capability.

This INRMP provides a brief description of the CMAGR and its natural resources, as well as a list of natural resource management programs and their goals. Also developed is a list of actions planned for the next five years to implement these programs and goals including a timeframe that outlines each project activity and how often it will occur (Appendix A). Actions are listed by program area and include priority classification, frequency, and regulatory requirements.

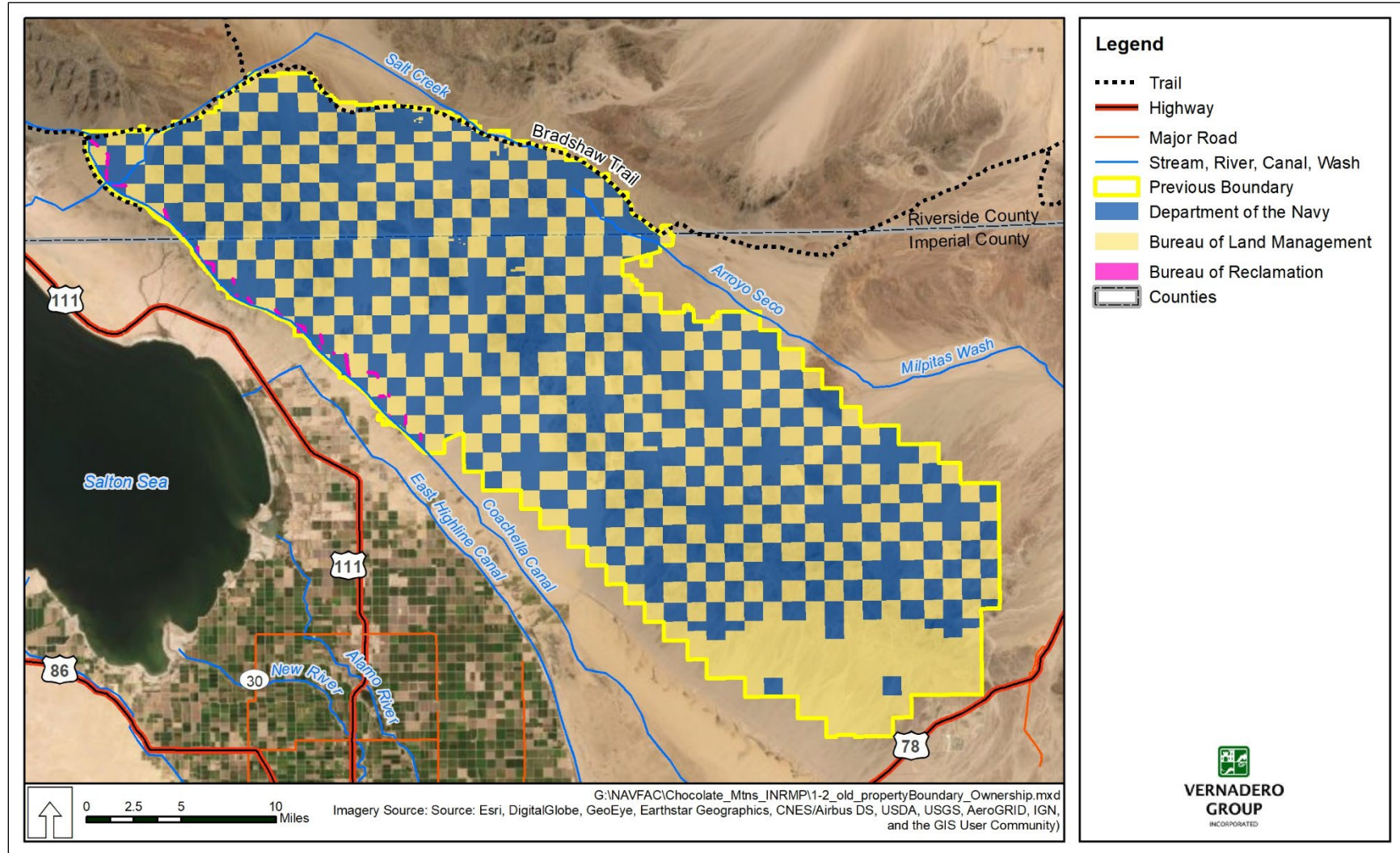


Figure 1-1. Administrative Jurisdiction and Range Boundary of the Chocolate Mountain Aerial Gunnery Range Prior to FY14 National Defense Authorization Act and Legislative Environmental Impact Statement Approval

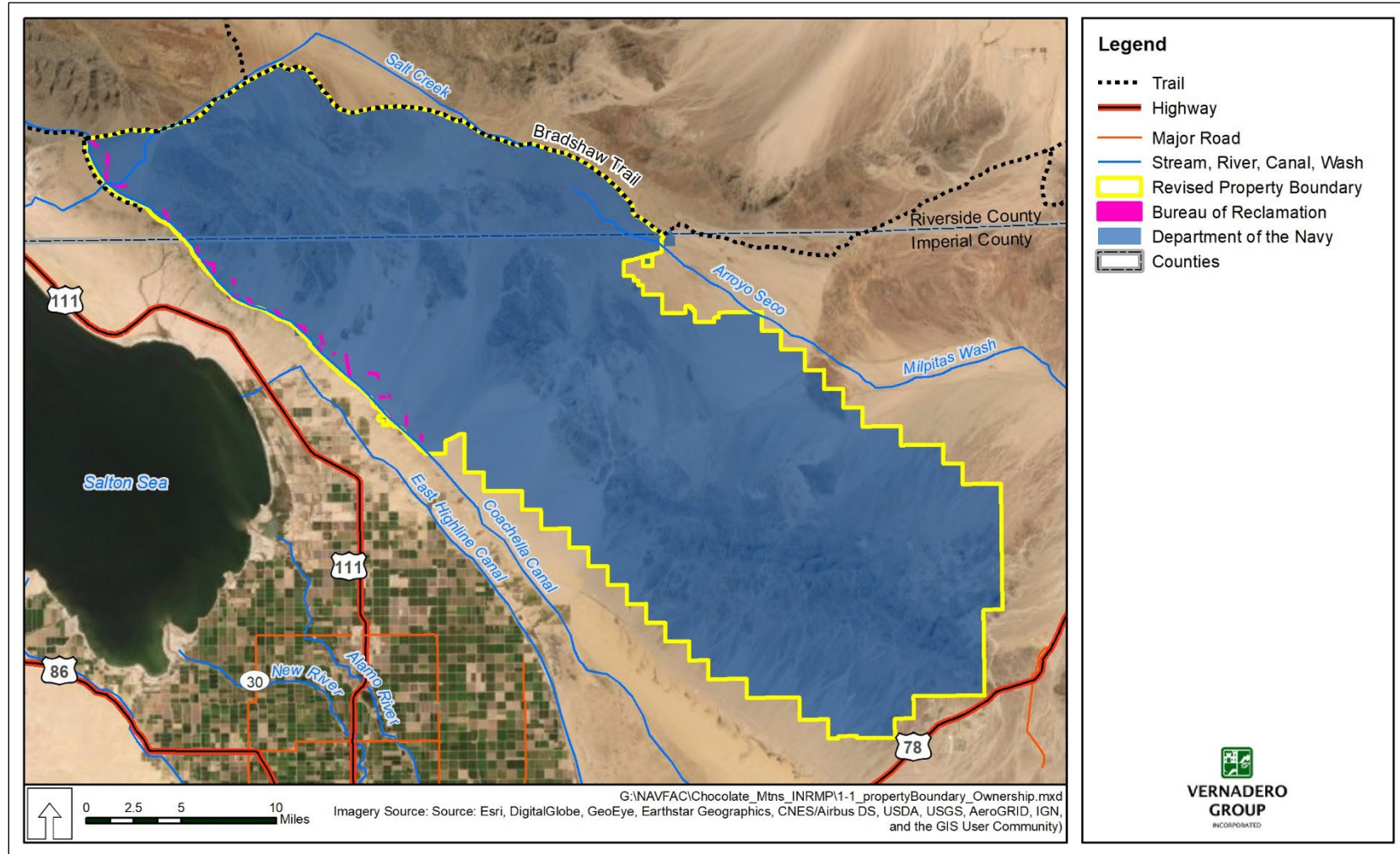


Figure 1-2. Administrative Jurisdiction and Range Boundary Changes on the Chocolate Mountain Aerial Gunnery Range following the FY14 National Defense Authorization Act and Legislative Environmental Impact Statement Approval

1.1 Purpose

The purpose of this INRMP is to guide implementation of an integrated, comprehensive plan for managing natural resources of the CMAGR. An INRMP was prepared in 2017 to comply with the FY14 NDAA and congressional mandate to revise the 2014 CMAGR INRMP to reflect changes in boundary, ownership, and administrative jurisdiction that could affect natural resource management strategies. This INRMP is needed to integrate any updates to natural resources management strategies that have been developed since the 2017 INRMP was written.

Under this INRMP, natural resources and military use will continue to be managed to ensure there is no net loss in the capability of the CMAGR to support its military purposes in a manner consistent with DoD ecosystem management principles. Further, this INRMP benefits threatened and endangered species consistent with federal and state recovery actions for these species under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531, *et seq.*). The stated purpose and scope for this INRMP are in accordance with the guidance provided by the Sikes Act, as most recently amended by the Sikes Act Improvement Act, 16 U.S.C. 670a, *et seq.*

This INRMP fulfills other responsibilities with regard to DoD and USMC policies and legal requirements regarding natural resource planning, including DoD Instruction (DoDI) 4715.03, *Natural Resource Conservation Program* (DoD latest version), and Marine Corps Order (MCO) 5090.2-V11, *Environmental Compliance and Protection Manual* (Headquarters, USMC [HQMC] 2018). This INRMP continues to use the *Handbook for Preparing, Revising and Implementing Integrated Natural Resources Management Plans on Marine Corps Installations* (HQMC 2007), hereafter referred to as the *Handbook*. This INRMP also continues to deliver the benefits provided to sensitive species by the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO).

This INRMP provides technical guidance for individuals planning and/or preparing Installation approvals, management actions, orders, instructions, guidelines, and standard operating procedures. It is not intended; however, for use by military personnel operating in the field. Field operations and activities are directed to adhere to guidelines, plans, orders, or other approvals that have been developed using this INRMP and have already had environmental compliance review and, where applicable, regulatory approvals and/or permitting. This INRMP does not dictate land use decisions, but rather provides important information to support sound land use and natural resources management decisions. National Historic Preservation Act requirements are not addressed in this INRMP. Cultural resources management issues (archaeological and historical) are addressed, more appropriately, within a separate Integrated Cultural Resources Management Plan for the CMAGR.

1.2 Authority

Legal authority for this INRMP is provided by the Sikes Act. The Sikes Act sets forth resource management policies and guidance for U.S. military installations and requires the preparation of INRMPs for installations with significant natural resources—including those composed of withdrawn lands. The Sikes Act requires that the "Secretary of Defense shall carry out a

program to provide for the conservation and rehabilitation of natural resources” [16 U.S.C. 670a (a)(1)(A) and (B)]. The Sikes Act further specifies in 16 U.S.C. 670a that:

Consistent with the use of military installations to ensure the preparedness of the Armed Forces, the Secretaries of the military departments shall carry out [a natural resources management program] to provide for—

- i. the conservation and rehabilitation of natural resources on military installations;
- ii. the sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and nonconsumptive uses; and
- iii. subject to safety requirements and military security, public access to military installations to facilitate the use.

The Sikes Act also requires that INRMPS be consistent with military installations use to ensure the preparedness of the Armed Forces. Each INRMP will, where appropriate and applicable, provide for:

- Fish and wildlife management, land management, forest management, and fish- and wildlife-oriented recreation
- Fish and wildlife habitat enhancement or modifications
- Wetland protection, enhancement, and restoration where necessary for support of fish or wildlife
- Integration of, and consistency among, the various activities conducted under the INRMP
- Establishment of specific natural resources management objectives and time frames for proposed action
- Sustained use by the public of natural resources to the extent such use is not inconsistent with the needs of fish and wildlife resources management
- Public access to the military installation that is necessary or appropriate for sustained use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, subject to requirements necessary to ensure safety and military security
- Enforcement of natural resource laws and regulations
- No net loss in the capability of military installation lands to support the military mission of the installation
- Such other activities as the Secretary of the military department considers appropriate

1.2.1 Marine Corps Order 5090.2-V11

MCO 5090.2 – V11 (HQMC 2018) requires all USMC installations having water and land suitable for the conservation and management of natural resources to prepare and implement a comprehensive INRMP that includes all elements of natural resources management applicable to the installation. An INRMP must accomplish the following:

- Preserve access to air, land, and sea space to meet military readiness requirements, as appropriate.
- Comply with applicable natural resources protection requirements (e.g., laws, Executive Orders, and regulations).
- Provide public access to installation lands, where practicable, provided such access does not conflict with military readiness and does not harm sensitive installation natural resources.
- Participate in regional ecosystem management partnerships provided such participation does not conflict with military readiness and does not harm installation natural resources.

1.3 Scope

This INRMP was developed in cooperation with USFWS and CDFW, and in coordination with the BLM and BOR. It presents the DoN/USMC's continued natural resources management program following the 2013 transfer of 228,324 acres of withdrawn land within the CMAGR from the administrative jurisdiction of the DoI to the DoN. This INRMP reduces the potential adverse effects on the species and habitat to simultaneously conserve the range biodiversity. INRMP implementation will improve long-range planning, decrease long-term environmental costs, reduce liabilities from environmental noncompliance, and improve the overall condition of natural resources to support the military mission. INRMP implementation will also increase knowledge of the CMAGR ecosystems through surveys, research, internal environmental awareness, and public outreach programs.

1.4 Roles and Responsibilities

1.4.1 Marine Corps Air Station Yuma

The CMAGR falls under the jurisdiction and control of the Commanding Officer of MCAS Yuma, Arizona, who reports to the Commanding General of Marine Corps Installations West (MCIWest) at Camp Pendleton, California, for administrative and facilities support. Figure 1-3 shows the chain of command for Commanding General MCIWest, including MCAS Yuma, and other installations such as Marine Corps Logistics Base Barstow, Marine Corps Base Camp Pendleton, MCAS Camp Pendleton, and MCAS Miramar. The Commanding Officer and Executive Officer administer the Installation while other departments provide support to users, including tenants and other transient personnel and activities.

USMC environmental management policy states (HQMC 2018):

The USMC is committed to mission accomplishment and to environmental protection. Minimizing adverse environmental impacts helps the Marine Corps to be a good steward, win hearts and minds, and sustain its combat capability into the future. The Marine Corps is committed to protecting the health and integrity of the environment, both at home and abroad, complying with the Nation's laws, conserving our natural resources and national treasures, preventing pollution through best management practices (BMP[s]) consistent with mission requirements, and consistent with mission objectives.

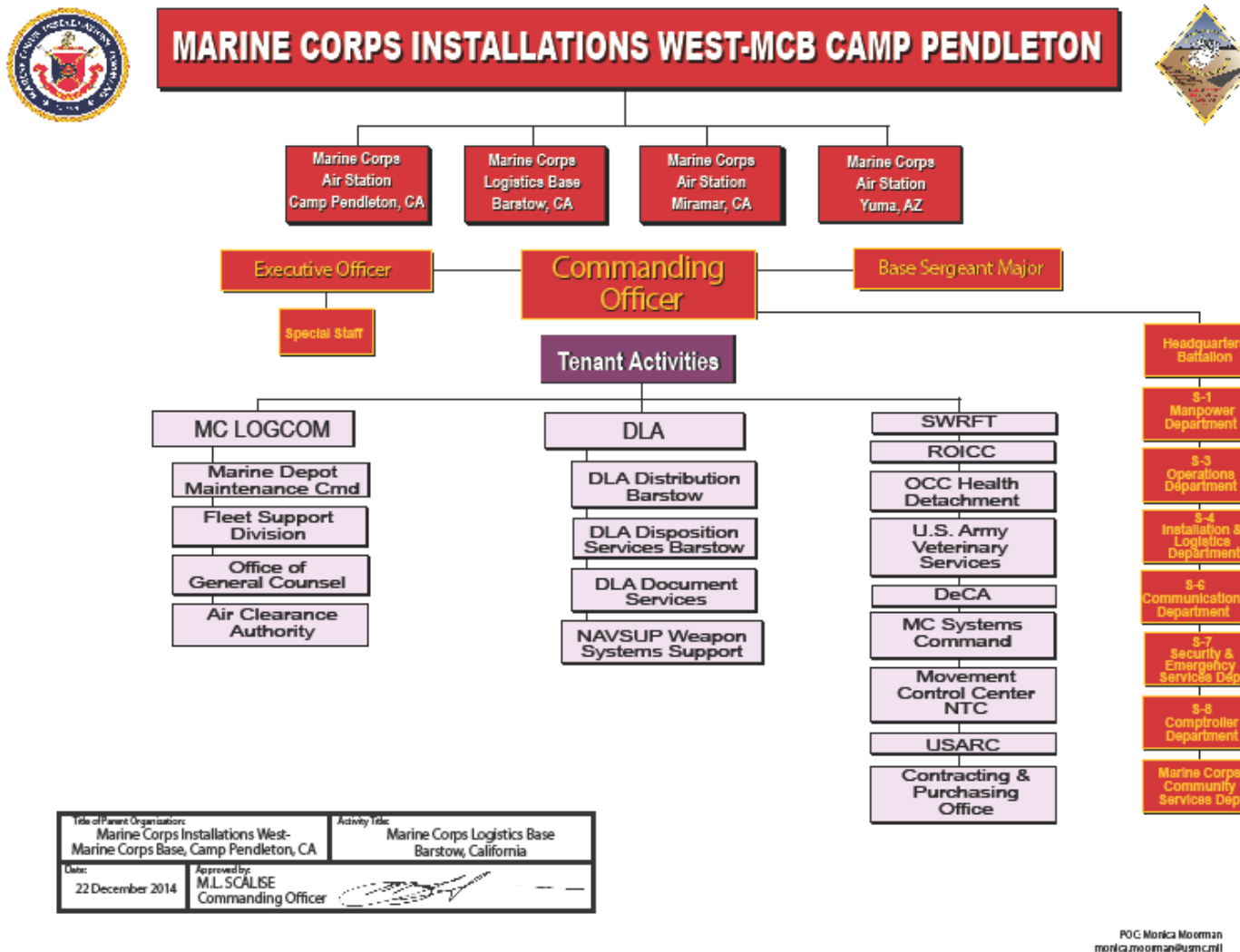


Figure 1-3. Chain of Command of Marine Corps Installations West

The Marine Corps shall continue to refine environmental management programs, proactively mitigate environmental and health risks, and ensure individuals are appropriately trained and empowered to provide stewardship of the lands to which the Marine Corps is entrusted.

The Commanding Officer ensures that activities and operations fully comply with federal, state, and local laws/regulations and with written DoD, DoN, and USMC policy. The Commanding Officer is charged with 19 tasks under MCO 5090.2 – V11 (HQMC 2018), to oversee the natural resources program and ensure the Installation's ability to carry out its military mission. The Commanding Officer also ensures that the INRMP is consistent with the use of military installations to ensure the preparedness of the Armed Forces and fulfills the requirements of the Sikes Act (16 U.S.C. 670a, *et seq.*) as amended.

The Commanding Officer's signature on the INRMP constitutes a commitment to seek funding and execute, subject to the availability of funding, all "must fund" projects and activities in accordance with the timeframes identified (MCO 5090.2 – V11 [HQMC 2018]).

The Range Management Department advises the Commanding Officer, MCAS Yuma, to assist with attaining the following objectives:

- Meet the military mission of the CMAGR.
- Minimize conflicts between the military mission and natural resources on the range.
- Maintain active and thoughtful compliance with the appropriate natural resource laws and regulations, agency guidance, relevant orders and binding regulatory opinions.
- Remain cognizant of regional natural resource initiatives and trends, maintaining involvement relating to the CMAGR's specific situation.
- Remain cognizant of public opinion and interest groups where these intersect with the CMAGR's specific situation, interacting with them when circumstances demand.
- Maintain an active, professional and mutually productive relationship with the regulatory authorities who monitor and advise on the CMAGR's specific situation.
- Anticipate and mitigate for the effects of infrastructure improvements and development on the natural resources on the CMAGR.
- Inventory and evaluate the natural resources on the CMAGR.
- Evaluate and set long-term management and conservation goals.
- Based upon the analysis of the CMAGR's experiences (both positive and negative) in natural resource management and conservation combined with new information, research findings, regulatory advice, etc. develop future goals, objectives, and actions to improve the CMAGR's stewardship of its natural resources.
- Maintain natural resources management information systems and programmatic guidance to meet the above aims.
- Maintain an array of relationships with other USMC and DoD installations to share information and experiences and coordinate actions on matters of mutual interest.
- Participate in regional ecosystem partnerships, provided such participation does not conflict with military readiness requirements and does not harm sensitive natural resources managed by the USMC.

1.4.2 Federal and State Wildlife Agencies

This INRMP was prepared with continued cooperation with the USFWS Pacific Southwest Region's Regional Director. The Regional Director in turn designated the Field Assistant Supervisor of the Palm Springs Office as the local USFWS representative. Congress has directed the DoN to utilize USFWS resources "to the maximum extent practical" to provide natural resources research on DoD installations in accordance with 16 U.S.C. 670c-670f(b). The INRMP was also prepared with continued cooperation with the CDFW Region 6 Office in Bermuda Dunes, California. The CDFW has primary jurisdiction over resident wildlife management within the CMAGR and shares a role in the recovery of endangered and threatened species.

The Sikes Act, 16 U.S.C. 670a(a)(2), states that the INRMP will reflect the "mutual agreement" of the USFWS, the state fish and wildlife agency, and the DoD "concerning conservation, protection, and management of fish and wildlife resources." The requirement for mutual agreement is further clarified by Section 670a(a)(4)(A)(ii), which states that "nothing in this subchapter enlarges or diminishes the responsibility and authority of any state for the protection and management of fish and resident wildlife."

Mutual agreement with the USFWS and the CDFW is met through the participation of these agencies in the review/update process, involvement throughout any revision development, and by signature to this INRMP. Coordination with the USFWS and the CDFW is expected to continue indefinitely as the review, planning, update, and revision cycle for this document will be ongoing. To the extent practicable, these agencies will participate in an ongoing review process by providing comments, recommendations, and input on the status of regional processes, surveys, and species.

1.4.3 Naval Facilities Engineering Systems Command Southwest

Naval Facilities Engineering Systems Command Southwest (NAVFAC SW) is responsible for planning, engineering, design, construction, real estate acquisition and disposal, and environmental services in a six-state area on the West Coast. NAVFAC SW also provides public works services such as transportation, maintenance, utilities/energy delivery, facilities management, and base operations support to DoN and USMC installations within its geographic area of responsibility, as well as support to other federal agencies in California. NAVFAC SW provides resource management technical and contracting support for MCAS Yuma, in which CMAGR falls within its jurisdiction and control.

1.4.4 Department of Interior

The BLM was formerly a participant in the management of the CMAGR due to the shared nature of the resource. The LEIS (DoN et al. 2013) transferred the land under the administrative jurisdiction of the BLM to the DoN and realigned the northwest boundary to exclude an established hiking trail from the DoN range. The BLM no longer maintains any administrative role with regards to CMAGR's land use or operations. The BLM was provided the opportunity to review and comment on the 2017 INRMP.

The BOR maintains a series of scattered dikes along the western boundary of the range. A Memorandum of Understanding (MOU) is being prepared between the DoN and BOR to formalize the process that the BOR would use to access and conduct maintenance activities on the dikes. MCAS Yuma provided the BOR with an opportunity to review and comment on the 2017 INRMP.

1.4.5 INRMP Tribal Consultation

DoDI 4710.02, *DoD Interactions with Federally-Recognized Tribes*, states that DoD Components will afford tribes that have a cultural or historical affiliation with lands encompassed by an installation an opportunity to consult on the development of INRMPs where tribal treaty rights or other rights to natural resources may potentially be affected. If such tribes are identified, DoD Components will incorporate a standard process for consultation in INRMPs whenever issues arise between the tribe(s) and the Component. DoD Components will involve tribal governments early in the planning process and will endeavor to complete consultations prior to implementation of the proposed action. Early involvement means that a tribal government is given an opportunity to comment on a proposed action in time for the tribal government to provide meaningful comments that may affect the decision. MCAS Yuma provided federally recognized tribes with an interest in the CMAGR an opportunity to comment on the 2017 INRMP. As the tribes were afforded an opportunity to provide comment on the 2017 INRMP Revision and given that this current update of the INRMP does not propose actions that are significantly or qualitatively different than those identified in the 2017 INRMP, no further consultation with the tribes is required at this time.

1.4.6 Public Review

Section 2905(d)(1) of the Sikes Act requires each military department to provide “an opportunity for the submission of public comments” for new and revised INRMPs. In 2017, a final Environmental Assessment (EA; Vernadero Group, Incorporated [Vernadero] 2017) associated with the 2017 INRMP was completed in accordance with the guidelines established by the National Environmental Policy Act (NEPA) of 1969. NEPA requires federal agencies to consider the environmental impacts of their actions before they are implemented, document those considerations, and involve the public in the process. NEPA applies to the approval of formal plans, programs, and specific projects. An EA is required when the action sponsor is uncertain as to whether or not the proposed action would significantly affect the Installation’s environment. An EA results in either a Finding of No Significant Impact (FONSI) or a requirement to prepare an Environmental Impact Study (EIS), the most detailed NEPA requirement. If the outcome of the EA is a FONSI, then the proposed action can continue, perhaps subject to specific conditions. This section summarizes these activities.

In 2016, public reviews of the Draft Revised INRMP and Draft EA were available for a 30-day review period commencing with the publication of a Notice of Availability in the *Yuma Sun* newspaper from 28 through 30 October 2016. Hard copies were made available for review at the main branch of the Yuma County Library District (2951 S. 21st Drive, Yuma, Arizona 85364) and at the City of El Centro Public Library (1140 N. Imperial Avenue, El Centro, California 92243). In addition, the Draft Revised INRMP and Draft EA were available online at the MCAS

Yuma website (<http://www.mcasyma.marines.mil/Staff-and-Agencies/Range-Natural-and-Cultural-Resources>). After the public review process concluded, the EA resulted in a FONSI (Vernadero 2017). No EIS was required. Given that the public was afforded an opportunity to provide comment on the 2017 INRMP Revision through the NEPA process, an EA was completed in 2017 resulting in a FONSI, and this current update of the INRMP does not propose actions that are significantly or qualitatively different than those identified in the 2017 INRMP, a copy of the Final 2022 INRMP will be made available to the public via appropriate means.

Cooperating Agencies

On 21 November 2014, the CDFW hosted a kickoff meeting in coordination with the USFWS. Other participants included NAVFAC SW, MCIWest, and BLM, which had representatives present to discuss specific tasks associated with the revised INRMP. The USFWS and CDFW were provided an opportunity to review an early draft INRMP, and a meeting was held at the CDFW Bermuda Dunes Office on 9 August 2016. MCAS Yuma solicited another review of the Draft Revised INRMP and Draft EA via email on 26 October 2016. The Final Revised INRMP was signed and finalized in January 2017.

Native American Tribes

MCAS Yuma solicited reviews of the Draft Revised INRMP and Draft EA from partner agencies and tribes via email on 26 October 2016. These tribes contacted were the following:

- Agua Caliente Band of Cahuilla Indians
- Ak-Chin Indian Community
- Cocopah Indian Tribe
- Colorado River Indian Tribes
- Fort Mojave Indian Tribe
- Gila River Indian Community
- Quechan Indian Tribe
- Salt River Pima-Maricopa Indian Community
- Tohono O'Odham Nation
- Torres Martinez Desert Cahuilla Indian

1.4.7 List of Preparers, Planning Team Members, and Persons/Agencies Consulted

Several agencies and individuals contributed to this INRMP update, including those listed below.

Marine Corps Air Station Yuma

Randy English, Conservation Program Manager
Bobby Law, Natural Resource Specialist
Jeremy Pennell, Natural Resource Specialist
Jonathan Gholson, GIS Analyst
Karla James, Cultural Resource Manager
Leo Williams, Law Enforcement Officer

Rich Cerka, Law Enforcement Officer
Lauren Allmon, Law Enforcement Officer
Michael Waliszewski, Law Enforcement Officer

Marine Corps Installations – West

Bill Berry, Regional Conservation Program Manager

Naval Facilities Engineering Systems Command Southwest

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U.S. Fish and Wildlife Service

Kerry Holcomb, Biologist
Vincent James, Colorado Desert Division Supervisor
Rollie White, Assistant Field Supervisor
Kent Kowalski, Biologist

California Department of Fish and Wildlife

Heather Brashear
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Bureau of Land Management

Nichole Gaddis, Environmental Scientist

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Eric Webb, President (Project Manager)
Nicole Kimball, Wildlife Biologist
Arnaud Kerisit, Biologist
Anička Kratina-Hathaway, Wildlife Biologist
Kyle McCann, Wildlife Biologist
Travis Gaussoin, Geographic Information System (GIS) Analyst
Maggie Fulton, Technical Editor

1.5 Management Approach

MCAS Yuma implements ecosystem management principles that are consistent with DoD and USMC policy. The ecosystem management approach seeks to balance the dual goals of maximizing land use for military readiness and maintaining native habitats. The overriding focus is to develop, promote, and refine a comprehensive, ecosystem-based management program for resource conservation. Such an ecosystem-based approach is intended to facilitate maximum support of the USMC military training mission and infrastructure, while simultaneously promoting both the sustainability of native species and habitat diversity, as well as compliance with applicable laws and regulations.

Guidance for the USMC's INRMP process is provided in the *Handbook* (HQMC 2007), which guides the preparation, revision, and implementation of INRMPs. This is done in compliance with the MCO 5090.2 – V11 (HQMC 2018) and the 2013 MOU among the DoD, USFWS, and the Association of Fish and Wildlife Agencies and in accordance with the Sikes Act as implemented by the Office of Secretary of Defense in *Updated Guidance on Implementation of the Sikes Act Improvement Act* (10 October 2002).

1.5.1 Principles of Ecosystem Management

An ecosystem can be defined as a dynamic, natural complex of living organisms interacting with each other and with their associated nonliving environment. Ecosystem management has been defined in various ways (e.g., Benton et al. 2008); however, all encompass a similar management approach.

The goal of ecosystem management, as established by the DoD, is to ensure that military lands support present and future training requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, this approach maintains and improves the sustainability and biological diversity of terrestrial and aquatic ecosystems while supporting sustainable economies, human use, and the environment required for realistic training operations (DoD 2013). DoDI 4715.03, *Natural Resource Conservation Program*, established the following principles and guidelines (DoD latest version):

- Maintain and improve the sustainability and native biological diversity of ecosystems.
- Administer with consideration for ecological units and timeframes. Ecosystem management requires consideration of the effects of installation programs and actions at spatial and temporal ecological scales that are relevant to natural processes.
- Support sustainable human activities. People and their social, economic, and national security needs are an integral part of ecological systems, and management of ecosystems depends upon sensitivity to these issues.
- Develop a vision of ecosystem health. Existing social and economic conditions should be factored into the vision.
- Develop priorities and reconcile conflicts.
- Develop coordinated approaches to work toward ecosystem health. Since ecosystems rarely coincide with ownership and political boundaries, cooperation across ownership is an important component of ecosystem management.
- Rely on best science and available data.
- Use benchmarks to monitor and evaluate outcomes.
- Use adaptive management. Ecosystems are recognized as open, changing, and complex systems. Management should be flexible to accommodate the evolution of scientific understanding of ecosystems.
- Implement through installation plans and programs. An ecosystem's desirable range of future conditions should be achieved through linkages with other stakeholders.

The DoD continues to shift its focus to provide for the protection of individual species through management of ecosystems. This approach requires land managers to form partnerships for

information exchange, pool resources to conduct mitigation and study natural resources, and collaborate to develop a shared vision for ecosystems.

1.5.2 Key Issues

The onset and continued cooperation between MCAS Yuma and the USFWS and CDFW, as well as coordination with the BLM and BOR, during the scoping of the initial INRMP led to the identification and development of key issues for ecosystem management of the CMAGR. These key issues are identified in this section and incorporated into the CMAGR Conservation Program described in Section 4.0.

Presence of Desert Tortoise and Its Critical Habitat on the CMAGR

One federally and state threatened species, the Mojave Desert population of the Agassiz desert tortoise (*Gopherus agassizii*), hereafter referred to as “desert tortoise,” is known to inhabit and has designated critical habitat on the CMAGR. Nothing in the transfer of withdrawn lands will affect the prior critical habitat designation for the desert tortoise. The USMC recognizes the need for an ecosystem approach to best manage the desert tortoise and other natural resources, as it is more efficient, balances ecosystem components (i.e., mission, biological, economic, and human elements), provides comprehensive ESA compliance, and integrates both DoD and DoI guidelines.

Potential Future Reintroduction of Sonoran Pronghorn in the Region

The draft Recovery Plan (USFWS 2015a) for the federally endangered Sonoran pronghorn (*Antilocapra americana sonoriensis*) specifies a list of objectives to achieve its goal of protecting the species and its habitat for the eventual delisting. Two of those objectives are to ensure rangewide viable populations and the availability of abundant, unfragmented habitat. The Recovery Plan intends to reintroduce Sonoran pronghorn onto additional sites within their historic range. This may include areas within the vicinity of the CMAGR, which would necessitate further analysis and discussion between project stakeholders.

The Presence of Other Special Status Species on the CMAGR

The CMAGR sustains numerous sensitive plant and animal species (as identified during other species surveys) although a rangewide survey has not been completed. The USMC’s natural resources conservation and management strategy includes habitat enhancement (e.g., exotics control, erosion control) and the avoidance and minimization of adverse impacts through implementation of programmatic instructions (published rules and guidelines for range land users). Additional information and data on the potential presence of other special status species is required and identified in Section 4.0.

Lack of Natural Resource Information

Thorough knowledge of the abundance, diversity, and status of natural resources both on and off the CMAGR is essential to good ecosystem management. Development and maintenance of such inventories is aided by the use of GIS, global positioning system (GPS), and remote

sensing technologies, combined with periodic surveys and monitoring. The routine collection of data and technology applications maximize the quality and quantity of information that allows the evaluation of potential impacts, biological trends, management initiative efficiencies, and identification of deficiencies. Updated information and “lessons learned” are then incorporated into the Installation’s management protocols and programmatic instructions. This ability to evaluate compatible and adaptive land use optimizes ecological conservation, while maximizing the land area available for training.

Military Mission and Public Access

Public access is precluded by safety and security requirements related to the aerial gunnery mission and potential for unexploded ordnance on the range. Therefore, this INRMP focuses solely on natural resource conservation and rehabilitation.

For public safety, flight safety, and operational security reasons, public recreational activities are also prohibited, whether they are military personnel or civilians. This restricted access reduces the scope of natural resource management challenges.

1.5.3 INRMP Implementation

INRMP implementation requires a commitment of intent, time, and money. Funding of strategies and projects are guided by the budget priorities assessed for environmental work on DoD installations. The funding priorities and process are described in DoDI 4715.03 (DoD latest version) and MCO 5090.2 – V11 (HQMC 2018). An installation is not required to fund all of its projects to fully implement an INRMP. An INRMP is considered implemented if an installation:

- Actively requests, receives, and uses funds for “must fund” projects and activities.
- Ensures that sufficient numbers of professionally trained natural resources management staff are available to perform the required tasks.
- Conducts annual coordination with all cooperating offices.
- Documents specific actions and accomplishments undertaken each year.

The Commanding Officer’s signature on the final INRMP constitutes a commitment to seek funding and execute, subject to the availability of funding, all “must fund” projects and activities in accordance with the timeframes identified (MCO 5090.2 – V11 [HQMC 2018]).

1.5.4 INRMP Review and Revision

Section 101(b)(2) of the Sikes Act [16 U.S.C. 670a(b)(2)] states that each INRMP “must be reviewed as to operation and effect by the parties thereto on a regular basis, but not less often than every 5 years.” The Sikes Act specifically directs reviews of the operation and effect, emphasizing whether existing INRMPs are current and implemented.

Annual Review and Reporting

In the third quarter of the FY, MCAS Yuma provides progress reports of ongoing and proposed projects to the USFWS and CDFW and seeks their input. In addition, conservation metrics are

submitted to the Commandant of the Marine Corps Facilities and Services Division for the preceding FY.

Annual reviews are intended to assess the status of key focus areas: INRMP implementation, status of federally listed species and habitats, ecosystem integrity, partnership effectiveness, recreational use and access, INRMP team adequacy, and impacts on the mission.

Although not expressly required by the Sikes Act, the outcome of this joint review is typically documented in a memorandum or letter summarizing the rationale for the conclusions the parties have reached. This documentation is then jointly executed to reflect the parties' mutual agreement and added to this INRMP in Appendix D.

Five-Year Review

No less than every five years, the INRMP is reviewed for operation and effect to determine if the Installation is complying with the Sikes Act. The review is conducted by representatives of the three cooperating parties: MCAS Yuma's Commanding Officer, USFWS's Regional Director, and CDFW's Director. While these are the responsible parties, designated technical representatives generally are the personnel who conduct the review.

The review for operation and effect of the INRMP either concludes that it 1) meets the intent of the Sikes Act, in which case it is updated, and the prescribed implementation continues, or 2) does not meet Sikes Act stipulations and must be revised.

INRMP Update

If updates are all that is needed, they are made in a manner agreed upon by all parties. The conclusions are documented in a jointly executed memorandum, meeting minutes, or in some other record that reflects mutual agreement and incorporated into Appendix D.

INRMP Revision

INRMP revision is a formal process that is nearly as detailed as initial INRMP development. Detailed reviews confirm that Installation mission, USFWS, and CDFW concerns are adequately addressed and the intent of the Sikes Act is met. MCO 5090.2 – V11 (HQMC 2018) provides the following guidance:

- Identify stakeholders.
- Identify military readiness mission and other land use requirements.
- Identify installation management requirements.
- Identify natural resources management objectives.
- Develop and evaluate natural resources management course(s) of action.
- Select and implement the natural resources management course(s) of action.
- Monitor and assess results.
- Review the installation INRMP annually and update it as necessary to maintain relevance and avoid extensive, costly INRMP revisions.

The existing INRMP remains in effect until the USFWS and CDFW have formally concurred with the Final Revised INRMP. There is no deadline for completion of the INRMP revision to ensure all concerns are addressed for all parties.

1.5.5 USMC Environmental Compliance Evaluation

The USMC conducts internal environmental and natural resource audits and inspections through an Environmental Compliance Evaluation (ECE) Program. MCAS Yuma's program is consistent with USMC guidance and includes benchmark ECE assessments and annual self-audits.

Working in conjunction with the Commandant-sponsored ECE, an annual ECE is completed as part of the Self-Audit Program. The Self-Audit Program goal is to assess compliance by reviewing all natural resource projects and programs. These annual self-audits ensure requirements are met and the effectiveness of environmental programs.

HQMC-sponsored benchmark ECEs are normally conducted once every three years, with a formal annual validation and report provided during intervening years. The results are used as a tool to plan, program, budget, and execute initiatives to achieve compliance. Comparisons of the benchmark ECE results are made for USMC-wide trend analysis. HQMC has established the following ECE Program goals:

- Provide the Commander with a tool to evaluate the Command's environmental compliance.
- Assess compliance levels and, as required, provide recommended corrective actions or improvements.
- Provide a forum for the exchange of ideas and successes.
- Provide the Commandant with a broad evaluation of environmental compliance across the USMC.
- Provide a formal interface among installations, Fleet Marine Forces Commanders, and the Inspector General.
- Integrate environmental awareness into every facet and function of the USMC way of life.
- Improve overall compliance efforts through a continuous, integrated program.

The ECE is similar to those conducted by the Inspector General or Field Supply Maintenance Analysis. They assess the Command's level of compliance, identify corrective actions, confirm the implementation of those proposed actions, and facilitate continuous improvement in compliance efforts through the Self-Audit Program. The most recent ECE for the CMAGR was conducted in 2021.

2.0 CMAGR SETTING, LAND USE, AND MILITARY MISSION

2.1 CMAGR Setting

The CMAGR lies on a southeast-northwest axis and is located in north-central Imperial County and south-central Riverside County, California. The range is bounded on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde mountains. The northern border is separated from the Orocopia Mountains by Salt Creek and includes part of the Chuckwalla Bench. The range extends south to Highway 78 near Glamis, California (Figure 2-1).

Due to the range's relatively remote location in a desert region, it has very few direct access points. The one exception is the Bradshaw Trail, located along the northernmost boundary of the CMAGR, and the rural road network associated with Camp Billy Machen and Slab City.

2.2 Regional Land Use

The CMAGR is located in a remote region of the eastern California desert. Land use around the CMAGR has not changed appreciably over the last century. Along the northernmost section is a series of geologic features with basin and range formations. These stark natural features create a natural buffer along the boundary of the CMAGR. Toward the western region, the lands remain primarily undeveloped with small nodes of scattered residential dwellings, recreational activities, and renewable natural resource exploration. Toward the southernmost region is the largest node of development activity, which is primarily industrial with active recreation areas with utility and transportation corridors. This area includes the Union Pacific Railroad (UPRR) right-of-way and the BOR's Coachella and Highline Canal systems, ultimately expanding toward the Imperial Valley agricultural belt and the Salton Sea State Recreational Area.

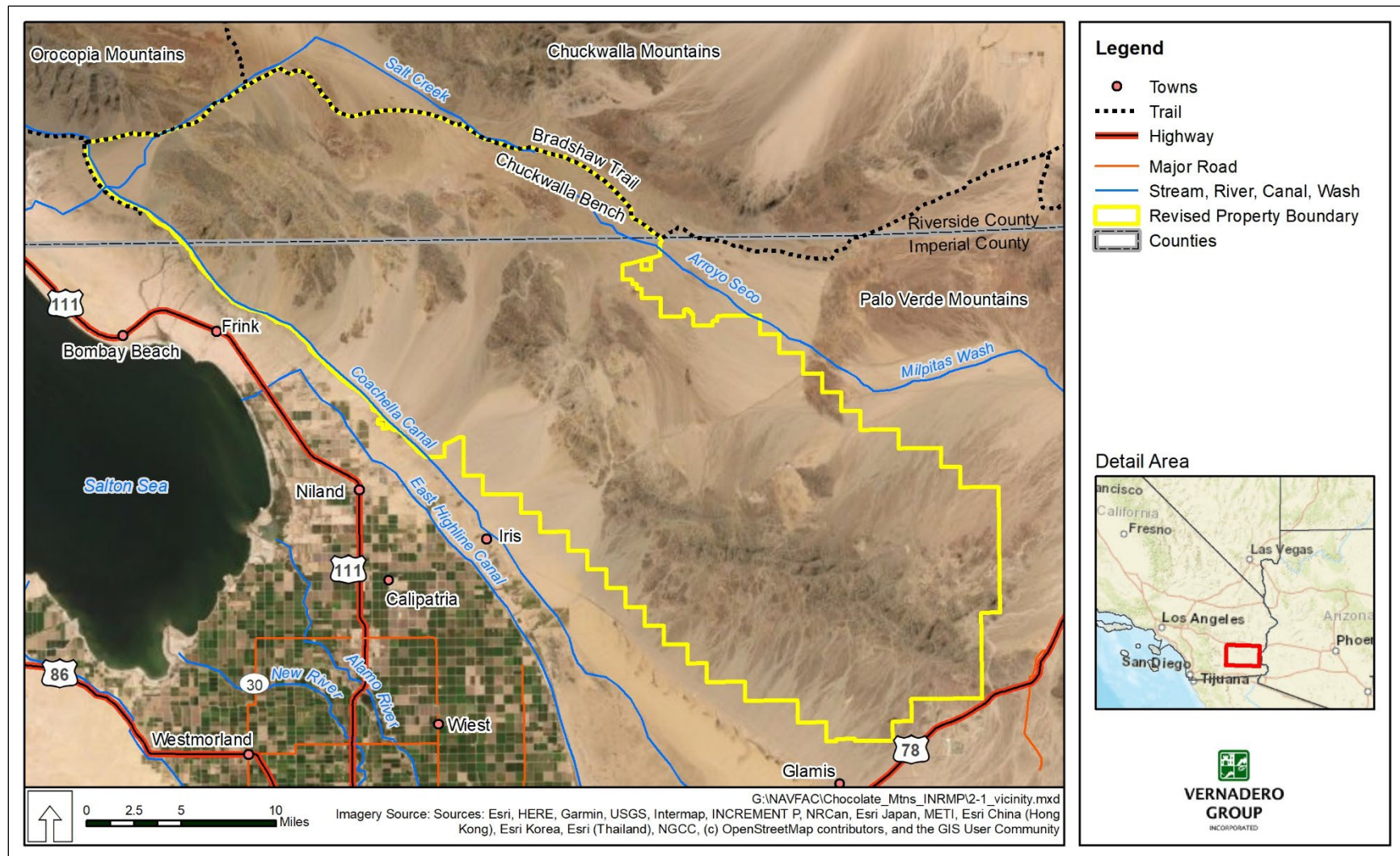


Figure 2-1. Chocolate Mountain Aerial Gunnery Range Vicinity Map

2.2.1 Land Status and Management Responsibilities

Lands within and along the perimeter of the CMAGR are described in this section in terms of land status or jurisdiction. Land status depicts the limits of administration or jurisdiction maintained by the major landholders or administrators. Land status designations are important as they directly determine agency jurisdiction, expenditure of management funds, as well as basic land use and resource management.

Northern Section

These lands are located toward the northern boundary of the CMAGR, adjacent to the Dos Palmas Preserve Area of Critical Environmental Concern (ACEC), and the western tip of the range, north and east toward the Little Chuckwalla Mountains. This section is within the planning boundaries of the BLM's Palm Springs-South Coast Field Office and Riverside County. The vast majority of the land in this area is administered by the BLM, and most of it is designated as an ACEC. This land is generally undeveloped and used primarily as open space for conservation with some recreational uses such as hiking, camping, bird watching, hunting, and rock hounding.

Eastern Midsection

This area is located toward the east and south of the midsection of the CMAGR, adjacent to the Riverside and Imperial county divide. The BLM El Centro Field Office manages the area south of the county divide. The existing land use in this area is heavily associated with renewable natural resources and utility infrastructure, with land ownership divided between public and private ownership (Figures 1-1 and 1-2). Residential dwellings are scattered throughout this area. Based on a review of aerial photography and limited field reconnaissance, it is difficult to discern if the dwellings on certain privately held parcels are abandoned or seldom used, perhaps as a weekend retreat.

Southeastern Section

The land use pattern associated with the southeast Region of Influence (ROI)—located outside of the CMAGR—is generally industrial, with some recreational uses. The Mesquite Gold Mine, which abuts the CMAGR, is operated as an open-pit mine with leaching pads for processing. It is considered to be one of the largest active gold mines in the country (New Gold 2011). Adjacent to the mine site is the newly permitted Mesquite Regional Landfill administered by the Sanitation Districts of Los Angeles County. The landfill covers approximately 4,245 acres and is permitted to receive waste by rail. A 5-mile-long rail spur connects the landfill to the UPRR main line, near the destinations of Glamis, Algodones Dunes, and the Imperial Sand Dunes Recreational Area (ISDRA).

Southwestern Section

The BLM El Centro Field Office and Imperial County previously held jurisdiction within the southwestern CMAGR and currently hold jurisdiction in the ROI (outside the CMAGR). The existing land use patterns are diverse and include several regionally significant destinations and

culturally relevant attractions. The UPRR and the Coachella Canal act as physical barriers for land use transition. Land use along the CMAGR ROI is primarily uninhabited and transitions from generally recreational to agricultural near the UPRR-Coachella Canal junction.

2.2.2 Regional, Federal, and State Jurisdiction and Management Plans

California Desert Conservation Area Plan (CDCA): Designated by the FLPMA in 1976, the CDCA is a 25-million-acre expanse of land in southern California. About 10 million acres are administered by the BLM. The range and surrounding region are included in the CDCA. Congress directed the BLM to prepare and implement a comprehensive, long-range plan for the management, use, development, and protection of the public lands within the CDCA based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The CDCA establishes goals for protection and use of the desert, designates distinct multiple-use classes for the lands involved, and establishes a framework for managing the various resources within these classes. These lands are managed in a controlled balance between higher-intensity use and protection. A wide variety of uses, such as mining, livestock grazing, recreation, energy, and utility development, are allowed. Damage created by permitted uses must be mitigated (BLM 1980).

The Northern and Eastern Colorado Desert Coordinated Management Plan (NECO): The NECO (BLM 2002b) is an amendment to the 1980 CDCA. The NECO is a landscape-scale, multiagency planning effort that protects and conserves natural resources while simultaneously balancing human uses within a planning area that encompasses over 5 million acres. Lands within the NECO area are popular for hiking, hunting, rock hounding, and driving for pleasure. Several commercial mining operations, livestock grazing, off-highway vehicle (OHV) recreational areas, and utility transmission corridors exist in the area as well. The NECO's planning boundary extends from the southwestern alignment of the CMAGR northeast toward Interstate 40 and southwest to Interstate 10.

Western Colorado Desert Routes of Travel Designations Amendment (WECO): The WECO is an amendment to the CDCA that was approved in 2003. The WECO designates preferred travel routes across BLM lands in the WECO Planning Area. The planning area covers approximately 475,000 acres and approximately 2,320 miles of OHV routes in parts of Imperial and San Diego counties. The WECO's planning boundary extends south and west of the CMAGR toward the Salton Sea. Following the CDCA, as amended, the BLM manages the type and level of OHV use to create an environment that promotes the health and safety of visitors and employees and alleviates conflict between nearby residents and recreational users (BLM 2002d).

Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP): The CVMSHCP establishes a reserve system to protect biodiversity while facilitating development in other parts of the Coachella Valley. The CVMSHCP provides for the protection and enhancement of biological values, with emphasis on the Big Morongo, the Fringe-Toed Lizard Preserve, and the Dos Palmas ACECs. The BLM provides a portion of the federal funding toward development and implementation of the CVMSHCP (BLM 2002c).

Regional Comprehensive Plan and Regional Transportation Plan: The Southern California Association of Governments' (SCAG's) Intergovernmental Review section, part of the Environmental Planning Division of Planning and Policy, is responsible for performing consistency reviews of regionally significant local plans, projects, and programs. The CMAGR is located within the regional planning boundary of the SCAG. Regionally significant projects are required to be consistent with SCAG's adopted regional plans and policies such as the Regional Comprehensive Plan and the Regional Transportation Plan. The criteria for projects of regional significance are outlined in California Environmental Quality Act guidelines, Sections 15125 and 15206 (SCAG 2008).

Riverside County General Plan: The CMAGR is located within both Riverside and Imperial counties. Both counties have adopted General Plans, which are described below. The Riverside County General Plan covers the entire unincorporated portion of Riverside County and is augmented by 19 detailed Area Plans covering the county's territory with the exception of the undeveloped desert areas. The goal of the General Plan is to manage the overall pattern of development more effectively. The Area Plans provide a clear and more focused opportunity to enhance community identity within Riverside County and stimulate quality of life at the community level. The Eastern Riverside County Desert Area (Non-Area Plan) governs the land densities north of the Riverside/Imperial County boundary line west toward Coachella Valley and east toward Blythe, California (Riverside County 2008).

The Imperial County General Plan: The Imperial County General Plan consists of nine elements: 1) Land Use, 2) Housing, 3) Circulation and Scenic Highways, 4) Noise, 5) Seismic and Public Safety, 6) Agricultural, 7) Conservation and Open Space, 8) Geothermal and Transmission, and 9) Water. Also included in the General Plan is a land use map designating a series of land use categories; the map identifies locations and indicates the type and anticipated maximum allowable density of ultimate development within the county (Imperial County 1993).

2.3 Military Use

During World War II (WWII), shortly after the bombing of Pearl Harbor and the U.S. entry into the war, Lieutenant General Lesley J. McNair, Director of Army Ground Forces and Combat Training for the War Department, established the Desert Training Center (DTC) in southeastern California, Arizona, and Nevada to train U.S. troops who might be sent to North Africa to fight the Germans (Henley 1992). General George S. Patton, Jr., was tasked with overseeing the transformation of the desert stretching from the California-Arizona border and the Mexican border up to lower Nevada. General Patton scouted the area by plane, jeep, and horseback beginning in March 1942. The area was suitable for training because of its general lack of human habitation, established railroads and highways, and the presence of several nearby military installations.

After 19 months of training and expansion, the DTC was officially renamed "The Desert Training Center California-Arizona Maneuver Area" (DTC/C-AMA) and had grown to an area twice the size of Maryland. The center included tank, infantry, and air units all training for desert warfare. Patton established his base of operations at Shaver's Summit (now Chiriaco Summit) at Camp

Young. Troops began arriving at the center in April 1942 and endured harsh physical training that included restricted access to water, physical endurance training, and lack of sleep. Life at the DTC/C-AMA was so difficult that the officers and enlisted men came to refer to the area as “the place that God forgot.” Patton commanded the DTC until July 1942, when he was placed in charge of “Operation Torch,” the Allied invasion of North Africa. Patton was replaced by Major General Alvan Gillem, Jr. Twelve thousand troops were stationed at the DTC when Patton left. As WWII continued, that number grew to over 200,000 by May 1943. The need for troops around the world during WWII required that troops be trained for combat in places other than North Africa. In light of this need, the California-Arizona Maneuvers Area was closed in April 1944.

To support the mission of the DTC/C-AMA, several desert airfields were taken over and significantly improved by the Army between 1942 and 1944. One of these wartime training bases was the Blythe Army Air Base, California, which was originally constructed by the Civil Aeronautics Administration in 1940 as Intermediate Flying Field Site 21. With the development of the DTC, the little airfield west of Blythe was identified as an excellent candidate for U.S. Army use, and it was officially taken over by the Army in April 1942, under the direction of General Henry H. Arnold, Commanding General of the Army Air Forces. One month later, the first airmen deployed to the DTC, the 46th Bombardment Group, arrived in Blythe, California, where they continued the work of building base housing, bringing in utilities, and significantly improving the airfield. By September 1942, the airfield was formally designated the Blythe Army Air Base, with paved runways suitable for heavy aircraft. From the fall of 1942 to 1945, the Blythe Army Air Base supported numerous training exercises in the DTC/C-AMA, and became known for its excellent training of heavy bomber crews who went on to complete hundreds of successful bombing missions in Europe during WWII.

With the end of WWII came a reduction in the military activity in the Colorado Desert region. Civilian buildings and airports converted for use by the military during the war years returned to civilian use. Surplus military barracks were recycled for a variety of uses throughout the local communities. The primary post-war activities in the area were mining and agriculture. Agricultural practices were primarily confined to the mid- to western side of the county, but also developed in the Palo Verde Valley along the lower Colorado River and centered on the City of Blythe, California.

2.3.1 Current and Future Military Mission

As an individual range, the CMAGR serves multiple training purposes. Its land and airspace, however, have been configured principally for live-fire training with aircraft weapons in an environment that realistically simulates a tactically diverse and complex air-ground battlefield. Figure 2-2 shows the CMAGR training and support facilities.

USMC ground combat activities are conducted on the CMAGR in support of aviation training and include artillery and mortar fires, as well as the insertion and extraction of ground combat forces. NSW forces conduct basic individual and advanced small unit training in one ground-training areas that underlies restricted airspace on the north and west perimeters of the

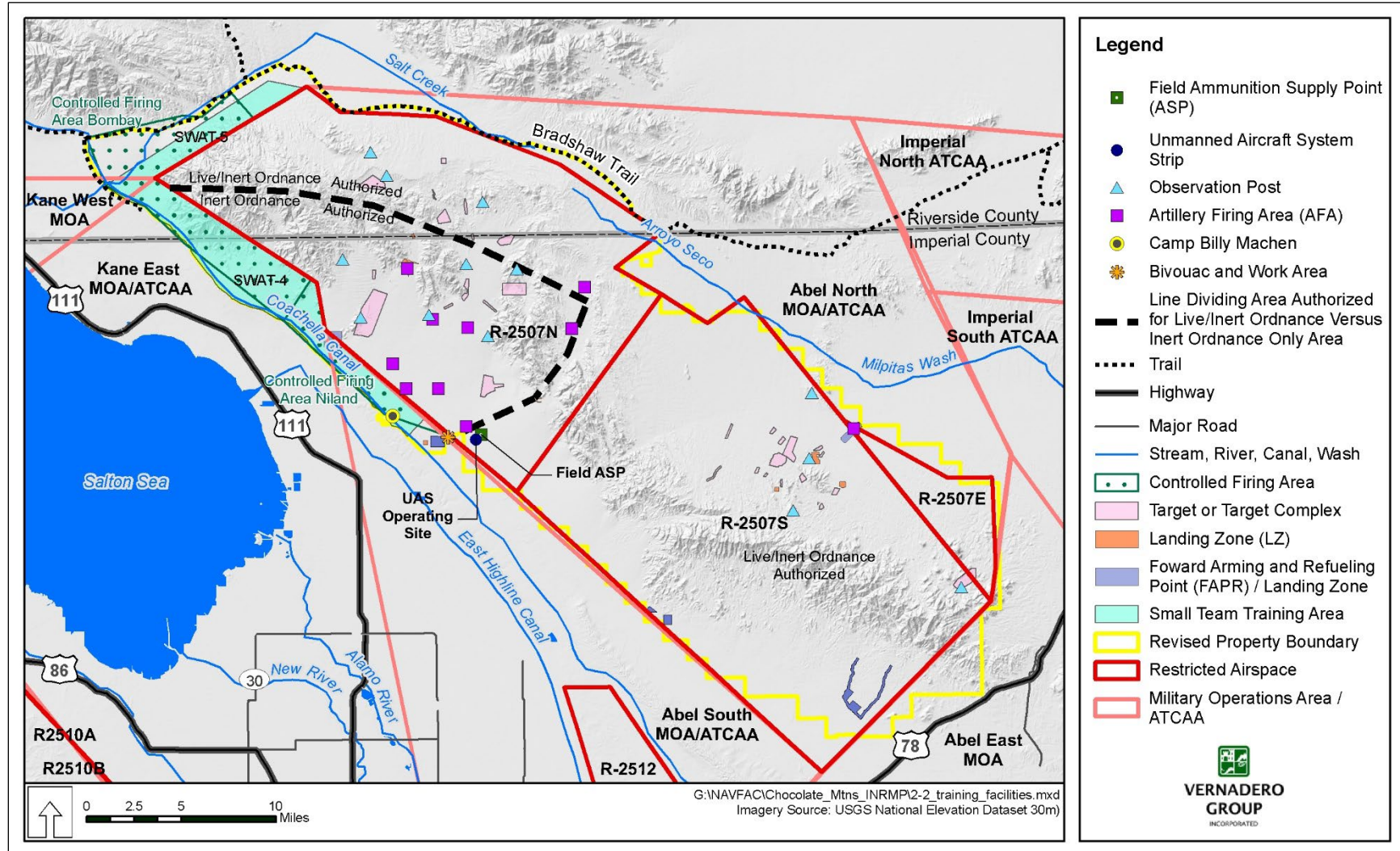


Figure 2-2. Chocolate Mountain Aerial Gunnery Range Training and Support Facilities

CMAGR. These training areas contain a variety of individual and small unit ranges used for USMC and NSW forces. Typically, these forces are battalion sized and smaller for the USMC and NSW teams. All ground-based training on the CMAGR occurs in designated locations that are consistent with the priority needs of aviation training. As an individual range, key assets and capabilities of the CMAGR include:

- Restricted land and airspace
- Supporting special use airspace
- Varied terrain
- Authorization for live-fire training with High explosive ordnance
- Ability to train with precision guided munitions
- Close proximity to air stations and bases

The CMAGR is, and will remain, indispensable to the DoN and USMC aviation and ground forces training into the foreseeable future. The USMC currently relies and will continue to depend on the CMAGR to support training of operational and student aircrews stationed in the local operating area. In addition to these local squadrons, training deployments by USMC, DoN, U.S. Air Force (USAF), Air National Guard, and Reserve Component units will continue to use the CMAGR on a frequent basis. The continuing need for the CMAGR is also indicated by active plans for replacement of the AV8 and F/A-18 with F-35 aircraft. The F-35 is flown by USMC squadrons at MCAS Yuma and MCAS Miramar. This transition began in 2012 and will extend through 2023. Most aircraft that are used in training in CMAGR originate from squadrons based at MCAS Yuma and MCAS Miramar. Other regionally based squadrons that regularly use the CMAGR are stationed in California at MCAS Camp Pendleton and Naval Air Station North Island, or on detachment to training at Naval Air Facility El Centro. Aircraft also originate from Luke Air Force Base in Arizona. Aircraft that originate from other USMC and Naval air stations and USAF bases or that are launched from DoN aircraft carriers in the Pacific Ocean are also frequently flown in training missions on the CMAGR. In total, roughly 100 squadrons from throughout the nation collectively fly more than 12,500 training flights annually on the CMAGR.

Training operations flown by F-35 aircraft stationed at MCAS Yuma are expected to occur 99 percent of the time within the BSTRC, including the CMAGR, and the Barry M. Goldwater Range (BMGR) West (DoN 2010). Further, planning has been completed to station up to eight squadrons of MV-22 aircraft at MCAS Miramar and up to two squadrons of MV-22 aircraft at MCAS Camp Pendleton. The MV-22s will conduct training operations on the CMAGR. The decisions for basing MV-22s at MCAS Miramar and MCAS Camp Pendleton and the decisions for basing F-35s at MCAS Yuma and MCAS Miramar demonstrate a long-term DoN commitment to these air stations and to the CMAGR along with all components of the BSTRC. The CMAGR is also an important training range asset for USMC and Navy ground forces, including NSW units, due to its proximity to the USMC ground forces and NSW units stationed in the San Diego area.

2.3.2 Military Land and Airspace Use

Training for tactical air and ground combat occurs on the CMAGR both as separate and combined arms elements. Air combat training also occurs in the military operations areas (MOAs) and air traffic control assigned air space (ATCAA) areas that are adjacent to the CMAGR and at the nearby El Centro Ranges (ECR). Twenty-five types of tactical aviation training activities currently occur on a regular basis on the CMAGR, adjacent MOAs and ATCAAs, and/or ECR to provide aircrews with the repertoire of combat skills they need (Table 2-1). Types of tactical aviation training other than those listed in Table 2-1 may also occur on an infrequent or as-needed basis. Future requirements for new types of training also will likely emerge to prepare aircrews to meet developing threats or to employ new aircraft, such as the MV-22 and F-35, and weapons systems as they come on line and mature operationally. Of the 25 air combat training activities listed in Table 2-1, 21 are supported on the CMAGR. Most training sorties involve more than one type of tactical aviation activity, and many involve the delivery of one or more types of ordnance.

Table 2-1. Common Aviation Training Activities on the CMAGR, El Centro Ranges, and Adjacent Military Operations Areas/Air Traffic Control Assigned Air Space

Air Combat Training Activity	Abel/Kane MOAs/ATCAAs			
	R-2512 at ECR			
	R-2510A/B at ECR			
	R-2507N/S/E at CMAGR			
Aerial Delivery: aircraft release parachuting personnel, sensors, equipment, or supplies.	X		X	
Aerial Photography: develop proficiency with handheld cameras.	X			
Aerial Refueling: develop proficiency in day and night aerial refueling.	X			X
Air Combat Maneuvering: offensive and defensive air-to-air combat tactics.	X	X	X	X
Air-to-Air Gunnery: air-to-air gunnery at an airborne target.	X			
Air-to-Air Missile Firing: engaging an airborne target with an air-to-air missile.	X			
Air-to-Ground Inert Ordnance Delivery: ground attack with conventional inert ordnance at day or night or in instrument weather conditions.	X	X	X	
Air-to-Ground Live Ordnance Delivery: ground attack with conventional live ordnance at day or night or in instrument weather conditions.	X			
All-Weather Operations: missions under all weather conditions, including air-to-air intercepts started beyond visual range where weapons engagement does not depend on visual identification. No weapons are launched or fired.				X
Close Air Support: flights designed to support friendly ground forces by delivering conventional air-to-ground ordnance, as directed by a forward air controller, on enemy positions in close proximity to the supported friendly forces.	X			
Combined Strike Tactics: combined air-to-ground strike with coordination of several types of aircraft and aircraft weapons.	X			

MOA – military operations area; **ATCAA** – air traffic control assigned air space; **ECR** – El Centro Ranges; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **FARP** – Forward Arming and Refueling Point

Table 2-1. Common Aviation Training Activities on the CMAGR, El Centro Ranges, and Adjacent Military Operations Areas/Air Traffic Control Assigned Air Space (cont.)

Air Combat Training Activity	Abel/Kane MOAs/ATCAAs			
	R-2512 at ECR			
	R-2510A/B at ECR			
	R-2507N/S/E at CMAGR			
Direct Air Support Holding: develop proficiency in the tactics of timing a supporting air-to-ground strike from a nearby holding position.				X
Fighter Intercepts: air-to-air weapons intercepts started beyond visual range where weapons engagement depends on visual identification.				X
Formation Flight: develop day or night proficiency in tactical formations and maneuvers.				X
Forward Air Control Airborne: control attack/fighter aircraft in close air support or direct air support missions.	X			
Helicopter Attack: teach the fundamentals of or develop tactical proficiency in any aspect of helicopter attack.	X			
Helicopter/MV-22 External Cargo Lifts: flights in which weights, personnel, cargo, vehicles, or aircraft are suspended from a helicopter or MV-22 and transported.	X			
Helicopter/MV-22 Forward Arming and Refueling: develop tactical proficiency in FARP operations.	X			
Helicopter/MV-22 Insertions and Extractions: develop tactical proficiency in inserting and extracting ground forces in battlefield areas.	X			
Helicopter/MV-22 Night Vision Goggle Operations: day or night flying with helmet-mounted thermal imaging devices.	X	X	X	
Helicopter/MV-22 Landing Zone Operations: flights designed to develop tactical proficiency in forward landing zone operations.	X			
Laser Targeting: use of weapons systems with laser target designators to attack ground targets.	X	X		
Post Maintenance Check Flight: review and validate the conditions of an aircraft following maintenance.	X			X
Unmanned Aircraft Systems Operations: flight operations conducted using remotely controlled unmanned aircraft systems.	X			
Visual Reconnaissance: visually locating targets, assessing topography, or assessing enemy order of battle.	X			

MOA – military operations area; **ATCAA** – air traffic control assigned air space; **ECR** – El Centro Ranges; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **FARP** – Forward Arming and Refueling Point

2.3.3 Military Surface Use

An inventory of military surface use was prepared for the CMAGR's *Draft LEIS* to identify and quantify areas of the range used to support training operations (Figure 2-3). Surface use was categorized by activity and levels of physical disturbance that various activities have on the ground surface, vegetative communities, and surface drainages.

The inventory found that 99.44 percent of the range surface is used to support the military mission and only 0.56 percent, or about 2,571 acres, has no assigned military mission. Previous to the 2014 approval of the CMAGR Land Withdrawal, the area of the range north of the Bradshaw Trail land had no assigned military mission. This portion of withdrawn public land has been returned to the BLM. Only a small proportion of the range (about 5 percent) supports surface uses that cause or may cause moderate to complete levels of physical disturbances. The military surface uses listed in Table 2-2 that cause or may cause moderate-to-high to complete levels of physical disturbance include:

- Target simulations and other earthwork features
- Core weapons impact areas
- Secondary weapons impact areas
- Some ground support sites
- Camp Billy Machen and its adjacent operating areas
- Range road corridors

The areas identified in the military surface use inventory (Table 2-2) include areas that are external to either its restricted airspace or controlled firing areas and, therefore, cannot support live-fire training. However, these areas can be used for various ground-based training or range management activities such as offsite helicopter or MV-22 landings for troop insertions or extractions, cross-country navigation, path finding exercises for small infantry teams, staging sites for target maintenance, or clearance activities. These peripheral areas are also managed to uses that are compatible with the CMAGR training mission.

A road network has been established to provide access for constructing and maintaining its infrastructure, conducting range operational clearances, training, and managing natural and cultural resources. Only designated roads and trails are used. Any new routes must be preapproved by the MCAS Yuma Range Management Department. Gas Line and Niland-Blythe roads are used by commercial utility companies to access, inspect, maintain, and/or repair the gas line and overhead electric transmission lines that cross the range.

Secondary weapons impact areas are included in this list because the interior areas closest to the target are moderately to highly impacted by ordnance deliveries (Figure 2-4); however, the level of disturbance sharply decrease with increasing distance from the target such that the levels of disturbance at their outer perimeters is negligible (DoN et al. 2013). As a result, more than half the area of the secondary weapons impact areas can be estimated to exhibit less than moderate levels of disturbance (DoN et al. 2013). Thus, the proportion of the CMAGR surface that is moderately to completely disturbed by military activities is likely no more than 2 percent, although the LEIS conservatively reported it as about 5 percent.

2.3.4 Nonmilitary Surface Use and Roadless Areas

BOR maintains dikes to protect the Coachella Canal and the inactive Eagle Mountain Railroad from uncontrolled surface runoff; both the canal and inactive railroad are within the CMAGR along its western and northern boundaries. Together, these two nonmilitary surface uses

encompass less than 100 acres. Three other nonmilitary surface uses cross the CMAGR, including a natural gas pipeline and two electric power transmission lines. Although these utilities are designated as avoidance areas for ordnance delivery training, the roads that were developed for constructing and servicing these utilities are also used for military transportation. These dual-purpose road corridors are therefore included in the inventory of military, rather than nonmilitary, surface uses.

Although affected by and needed to support military use, the 95 percent of the range that is roadless (Table 2-3) remains in a relatively undeveloped, unstructured, and undisturbed condition. Military purposes served by these areas include weapons delivery containment areas; non-live-fire training, support, and range access control areas; and Special Warfare Training Areas (SWATs) 4 or 5. There are 14 roadless areas (Figure 2-5) on the CMAGR that are 5,000 acres or larger. Most of these areas, including the largest area (about 139,430 acres), are classified as weapons delivery containment areas.

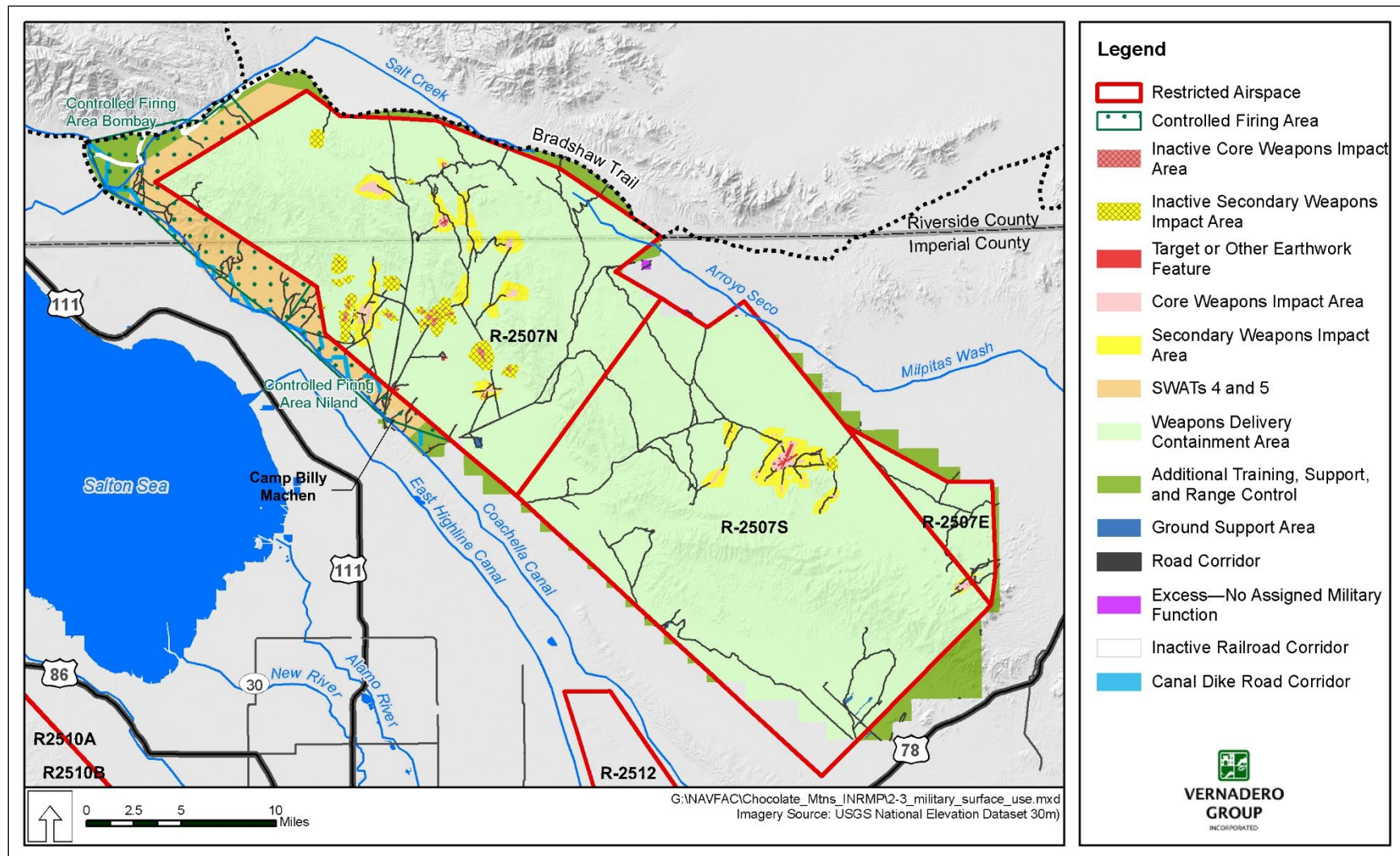


Figure 2-3. Military Surface Use on the Chocolate Mountain Aerial Gunnery Range

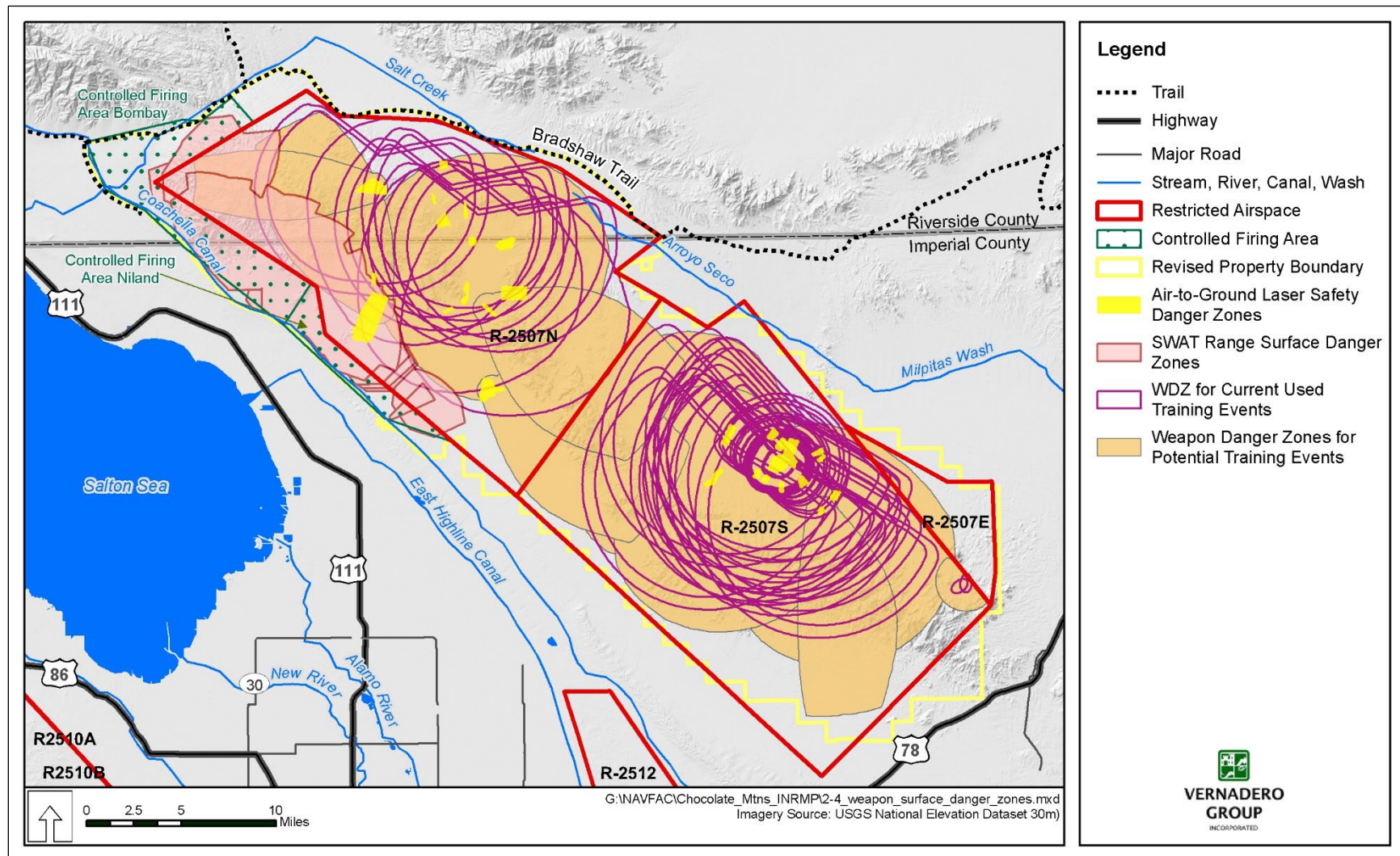


Figure 2-4. Weapon and Surface Danger Zones and Laser Safety Danger Zones on the Chocolate Mountain Aerial Gunnery Range

Table 2-2. Military and Nonmilitary Surface Use Areas on the Chocolate Mountain Aerial Gunnery Range

	Surface Use Area	Associated Surface Disturbance	Pre-NDAA Total Area in Acres (% CMAGR)	Post-NDAA Total Area in Acres (% CMAGR)
Military Surface Use				
1	Target Simulations and Other Earthwork Features	Physical disturbance of entire ground surface, extensive alteration of surface drainage, and complete removal of native vegetation community. Periodic regrading of target simulations/earthworks keeps vegetation communities from reestablishing and disrupting surface drainage.	200 (0.04)	200 (0.04)
2	Core Weapons Impact Area	Disturbance of ground surface at or near some targets is extensive to complete where high-yield, high-explosive ordnance detonations over time result in concentrated and coalescing craters that may reach depths in excess of 10 feet. Vegetative communities are eliminated near targets. Natural surface drainage patterns can be substantially altered. In areas farther from targets where impact craters densities are lower and do not overlap, ground surfaces between craters and vegetative communities are still subject to ordnance blast and shrapnel effects and ejecta from craters. Use over time is likely to subject nearly any ground location in the core weapons impact area to ordnance delivery effects.	2,309 (0.5)	2,309 (0.5)
3	Secondary Weapons Impact Area	Clusters of high-yield, high-explosive impact craters cause concentrated ground disturbance in some localized areas, especially at and near individual targets, but impact craters numbers and densities generally decrease sharply with increasing distance from targets. Physical disturbance of the ground surface also generally decreases sharply with distance from individual targets, and the natural processes shaping ground/soil surfaces, surface drainages, and vegetative communities become increasingly predominant. Physical disturbance in the regions of this area closest to the target is moderate to complete; disturbance in the outer region decreases from moderate to negligible with increasing distance from the target.	19,391 (4.21)	19,391 (4.24)

NDAA – National Defense Authorization Act; **CMAGR** –Chocolate Mountain Aerial Gunnery Range; **FARP** – Forward Arming and Refueling Point; **SWAT** – Special Warfare Training Area; **SEAL** – Sea, Air and Land; **OHV** – off-highway vehicle; **BLM** – Bureau of Land Management

Table 2-2. Military and Nonmilitary Surface Use Areas on the Chocolate Mountain Aerial Gunnery Range (cont.)

	Surface Use Area	Associated Surface Disturbance	Pre-NDAA Total Area in Acres (% CMAGR)	Post-NDAA Total Area in Acres (% CMAGR)
4	Weapons Delivery Containment Area	Some scattered ordnance impacts craters but, in the context of the broader landscape disturbances to ground surfaces and vegetative and wildlife communities, these impacts are negligible. Natural processes shaping ground/soil surfaces, surface drainages, and vegetative and wildlife communities function without discernible constraint from ordnance delivery.	368,607 (80.07)	368,607 (80.52)
5	Ground Support Sites (21 individual sites including FARPs, Firebase Burt/Staging Area, Siphon 8 Bivouac and Work Area, unmanned aircraft system airstrip, and additional training sites)	Moderate to complete levels of disturbance to ground surfaces, surface drainages, and vegetative communities. Disturbances in FARPs, Firebase Burt/Staging Area, and additional training sites result in moderate to high levels of disturbances in areas of concentrated and repeated use by vehicles, troop bivouacs, aircraft landings and takeoffs, aircraft refueling and rearming, and other ground unit work areas such as communications or air control sites. Construction/grading of the Siphon 8 Bivouac and Work Area, Field Alcohol Screening Program, and the unmanned aircraft system airstrip required complete reshaping of the existing ground surface; however, the airstrip and associated ground troop bivouac and work areas are located within a larger inactive and historic rock quarry site in which the ground surfaces, surface drainages, and vegetative communities had been previously and completely altered from the undisturbed natural condition.	429 (0.09)	429 (0.09)
6	Camp Billy Machen and Associated Static Ranges	High to complete levels of disturbance to ground surfaces, surface drainages, and vegetative communities as a result of the construction and use of the Camp Billy Machen and associated static ranges.	134 (0.03)	134 (0.03)
7	SWAT 4	Negligible to low levels of disturbance to ground surfaces, surface drainages, and vegetative communities over most of the SWAT live-fire training area. Moderate to high levels of disturbance to ground surfaces, surface drainages, and vegetative communities in some small and dispersed areas (individually less than an acre) where concentrated or repeated use by Navy SEALs has occurred.	31,593 (6.86)	31,593 (6.90)

NDAA – National Defense Authorization Act; **CMAGR** –Chocolate Mountain Aerial Gunnery Range; **FARP** – Forward Arming and Refueling Point; **SWAT** – Special Warfare Training Area; **SEAL** – Sea, Air and Land; **OHV** – off-highway vehicle; **BLM** – Bureau of Land Management

Table 2-2. Military and Nonmilitary Surface Use Areas on the Chocolate Mountain Aerial Gunnery Range (cont.)

	Surface Use Area	Associated Surface Disturbance	Pre-NDAA Total Area in Acres (% CMAGR)	Post-NDAA Total Area in Acres (% CMAGR)
8	Additional Training, Support, and Range Access Control Areas	Negligible levels of disturbance to ground surfaces, surface drainages, and vegetative communities over most of areas as a result of military training and range support activities. Low to moderate levels of disturbance in some dispersed perimeter areas near public use roads outside of the range likely due to trespass OHV use by nonmilitary users.	31,490 (6.84)	31,490 (6.88)
9	Range Road Corridors (427 miles of road segments in aggregate with a standardized corridor width of 15 feet, excludes road segments that traverse target simulations or core weapons impact areas, Lines 1 and 2)	High to complete levels of disturbance to ground surfaces, surface drainages, and vegetative communities within road corridors. Corridors vary in width as they result from lightly used, single-lane tracks to frequently used graded roads. Area calculations are based on a standard corridor width of 15 feet to represent an average disturbance and influence zone associated with road maintenance and use.	740 (0.16)	740 (0.16)
10	Total Military Surface Use (Sum of Lines 1 - 9)		454,893 (99.99)	454,893 (>99.99)
Nonmilitary Surface Use				
11	Excess Area (Includes 2,000 acres of land to the north of the Bradshaw Trail reverted to the BLM. Since this land had no assigned military function, there will be no net loss of military training aboard CMAGR.)	Negligible levels of disturbance to ground surfaces, surface drainages, and vegetative communities over most of areas; low to moderate levels of disturbance in some small and dispersed areas likely due to nonmilitary activities, including OHV use.	5,367 (1.17)	2,778 (0.61)

NDAA – National Defense Authorization Act; **CMAGR** –Chocolate Mountain Aerial Gunnery Range; **FARP** – Forward Arming and Refueling Point; **SWAT** – Special Warfare Training Area; **SEAL** – Sea, Air and Land; **OHV** – off-highway vehicle; **BLM** – Bureau of Land Management

Table 2-2. Military and Nonmilitary Surface Use Areas on the Chocolate Mountain Aerial Gunnery Range (cont.)

	Surface Use Area	Associated Surface Disturbance	Pre-NDAA Total Area in Acres (% CMAGR)	Post- NDAA Total Area in Acres (% CMAGR)
12	Inactive Railroad Corridor (9.28 miles of corridor with a width of 40 feet)	Complete levels of disturbance to ground surfaces, surface drainages, and vegetative communities within the railroad corridor.	44 (<0.01)	44 <0.01
13	Canal Dike Corridors (27 miles of aggregate corridor with a width of 15 feet)	Complete levels of disturbance to ground surfaces, surface drainages, and vegetative communities within these graded canal dike corridors.	45 (<0.01)	45 <0.01
14	Total Nonmilitary Surface Use (Sum of Lines 11 and 15)		5,456 (.01)	2,867 (<0.01)
15	Total Military and Nonmilitary Surface Use (Sum of Lines 10 and 16)		460,349 (100)	457,760 (100)

NDAA – National Defense Authorization Act; **CMAGR** –Chocolate Mountain Aerial Gunnery Range; **FARP** – Forward Arming and Refueling Point; **SWAT** – Special Warfare Training Area; **SEAL** – Sea, Air and Land; **OHV** – off-highway vehicle; **BLM** – Bureau of Land Management

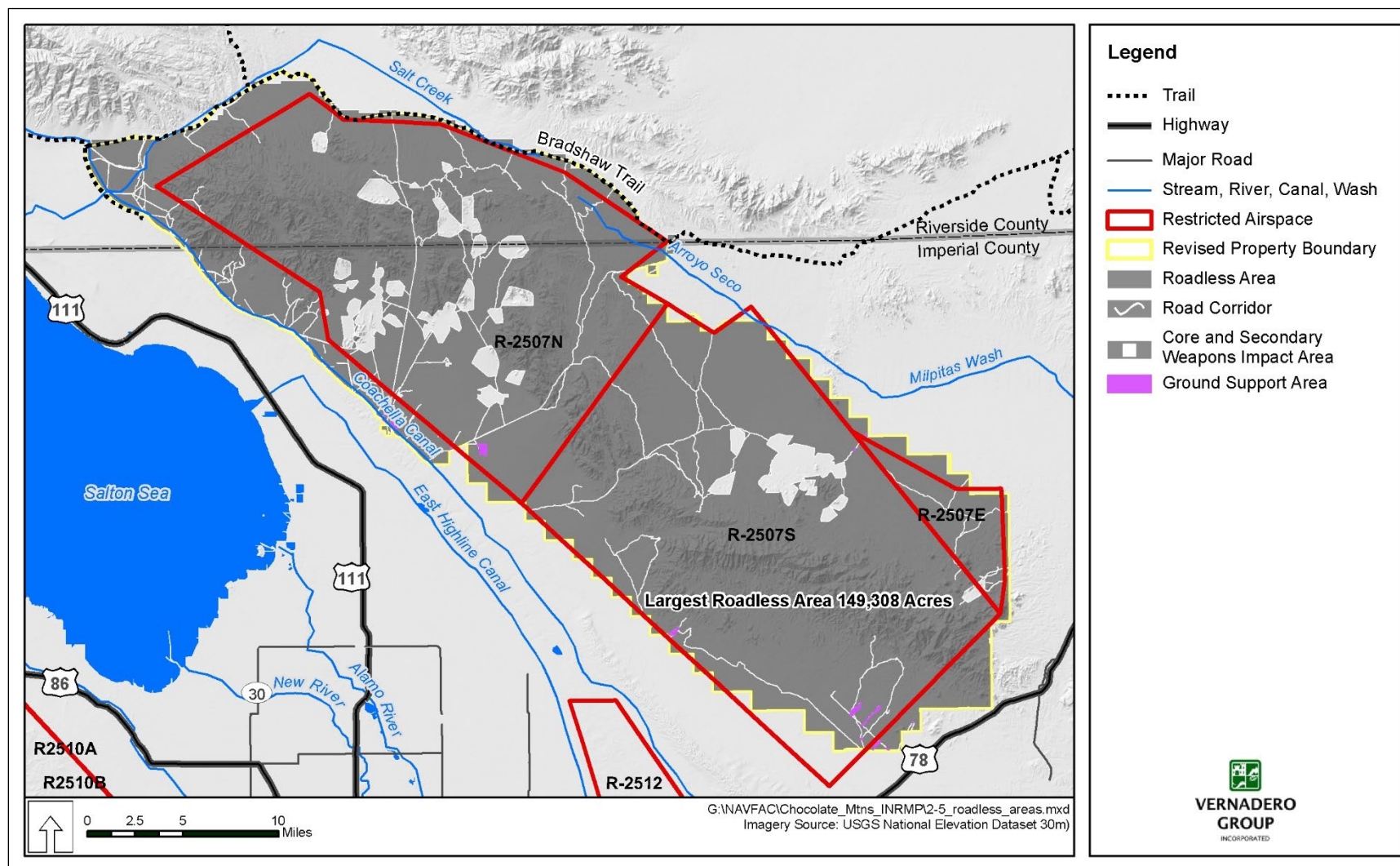


Figure 2-5. Roadless Areas on the Chocolate Mountain Aerial Gunnery Range

Table 2-3. Number of Roadless Areas on the Chocolate Mountain Aerial Gunnery Range*

Roadless Area Category*	Number of Roadless Areas	Comments
Less than 1,000 Acres	241	
1,000 Acres to 5,000 Acres	15	
5,001 Acres to 10,000 Acres	7	
10,001 Acres to 20,000 Acres	2	Roadless areas of 15,954 and 17,690 acres
20,001 Acres to 40,000 Acres	3	Roadless areas of 22,752, 24,538, and 36,160 acres
40,001 Acres to 100,000 Acres	1	Roadless area of 73,814 acres
Greater than 100,001 Acres	1	Largest roadless area is 139,430 acres

* Figure 2-5 shows roadless areas on the CMAGR.

2.4 Public Access and Safety

Public access is not permitted within the CMAGR, therefore, there are no recreational opportunities within the range's boundaries. Public access to its road network is prohibited at all times because of live ordnance hazards and to prevent interruption of military training. Niland-Blythe Road and Gas Line Road receive periodic commercial use to service transmission and gas pipe lines that cross the range through R-2507N. Commercial entry to the CMAGR to service these utilities is only on an as-authorized basis.

2.4.1 Unauthorized Access

A series of signs warning unauthorized personnel not to enter the Range Training Area are posted along the range perimeter to protect the general public from intentional or accidental entry onto the CMAGR. The signs are placed so an individual standing anywhere along the range perimeter would be able to see a sign when looking to the left or right. The warnings are written in both English and Spanish. MCAS Yuma Range Maintenance is responsible for keeping warning signs up to date.

MCAS Yuma, Imperial Valley Sheriff's Office, and other local and federal law enforcement officials periodically conduct physical patrols of the range boundaries to remove trespassers. MCAS Yuma maintains access control gates at the entry and exit points to the CMAGR. In addition, MCAS Yuma conducts public outreach programs to raise awareness of the military training mission and associated hazards.

Unauthorized personnel are not allowed on the CMAGR at any time, but there are occasions where trespassers or "scrappers" access the range despite patrols, arrests, verbal notices, and warning signs. Scrappers enter the CMAGR without authorization for the purpose of removing salvageable materials such as aluminum, brass, and copper. Scrappers have been known to be armed and sometimes present a danger to anyone who approach them. Under Station Order (StaO) 5532, requirements have been established regarding the use of force by non-law-enforcement personnel. The standard procedure is to immediately notify Range Control with a

complete description of the trespassers and their location. In accordance with StaO 3710.6I directives, any live-fire exercises are terminated until the detected trespassers are removed from the range. Unauthorized personnel and vehicles found within range boundaries or spotted by either an airborne crew or authorized person is reason to abort ordnance training operations in that area, thereby interfering with training activities, costing taxpayers money for such disruptions. There have been 60 citations issued since 2016.

2.5 Renewable Energy Impact on Regional Land Use

The lands surrounding the CMAGR have been identified by various federal, state, and local agencies as highly suitable for renewable and natural resource development owing to the combination of government policies, acts, and plans; remoteness of the region; availability of water; existing infrastructures; and geographical expanse of open space.

The eastern boundary of the range is bordered by desert tortoise critical habitat, as well as the BLM's Chuckwalla ACEC and National Conservation Lands under the approved State of California Desert Renewable Energy Conservation Plan (DRECP). On a national scale, this National Conservation Land designation is intended to provide BLM's highest level of protection for its most ecologically valuable lands. The western boundary of the range lies proximate to the Algodones Dunes Wilderness Area, but remaining portions of this area are multiple use lands with public recreation and renewable energy priorities.

The following energy policies, plans, and initiatives may influence energy development within the CMAGR ROI.

Federal Land Transaction Facilitation Act (FLTFA): The FLTFA, also referred to as the Baca Act, was signed into law on 25 July 2000 (BLM 2000). The FLTFA directs revenues generated from the sale or disposal of certain public lands to an acquisition account. Four agencies, including the BLM, U.S. Forest Service, National Park Service, and USFWS, can use the acquisition account to purchase lands within federally designated areas from willing sellers. The account can also be used by the BLM to place public lands for sale. The agencies entered into a national MOU in May 2003 for land purchases governed under the FLTFA. In California, the four regional offices of the agencies entered into a MOU, under a Statewide Interagency Implementation Agreement (BLM 2005).

West Chocolate Mountains Renewable Energy Evaluation Area (REEA): On 14 December 2012, the BLM released the REEA Final EIS, which is proposed to amend the CDCA. The REEA evaluates the potential environmental impacts of allocating federal mineral estate (not including acquired lands) for geothermal energy leasing, testing, and development of geothermal power generation facilities on public lands near the CMAGR. The REEA was also prepared to evaluate the potential environmental impacts of allocating the BLM-administered federal surface estate in the same planning area for testing and development of solar and wind power generation facilities (BLM 2012b). The REEA prohibits/discourages wind and other technologies by imposing height restrictions to avoid conflicts with the military mission on adjoining lands. The BLM's DRECP also precluded wind and solar development south of the

range in the Cargo Muchacho District because of conflicts with longstanding and ongoing military aerial training operations.

The Renewable Energy Transmission Initiative: California has adopted energy policies that require substantial increases in the generation of electricity from renewable resources. This statewide initiative assists the state in identifying the transmission projects needed to accommodate renewable energy goals, support future energy policy, and facilitate transmission corridor designation and transmission and generation siting and permitting (California Energy Commission 2010).

Renewable Energy at the County Level: Riverside and Imperial counties have recently adopted or are in the process of updating land use ordinances that provide for the physical land use planning criteria, development standards, and regulations for potential development pertaining to alternative energy within the CMAGR ROI (DoN et al. 2013). In July 2014, Riverside County initiated the Eligible Renewable Energy Development Planning program funded by a grant from the California Energy Commission. One solar energy developable area has been identified proximate to and west of CMAGR, west of the Coachella Canal and east of the Salton Sea. In Imperial County, numerous solar energy projects have been approved or are operational proximate and west of Calexico.

Renewable Energy Projects: Two major renewable energy nodes are adjacent to the CMAGR. The first node is adjacent to the northwest of the CMAGR boundary, within Riverside County and west of the Little Chuckwalla Mountains. The second node is east of the southeastern section of the CMAGR, near New Gold's Mesquite Mine and east of State Route 78. This node is within the BLM California Desert District's utility corridor. No wind energy projects are currently active according to the BLM renewable energy website (<https://www.blm.gov/programs/energy-and-minerals/renewable-energy/active-ren>). However, effects on military training will be evaluated for all future proposed renewable energy projects adjacent to the CMAGR.

2.6 Recreation Influence on Regional Land Use

Public access is not permitted within the CMAGR. Therefore, there are no recreational opportunities or other recreational uses of the natural resources within its boundaries.

Recreational uses such as hiking, camping, bird watching, hunting, rock hounding, and other recreational activities are permitted off the range. These uses are primarily dispersed activities and are low- to moderate-level uses. Adjacent areas of public lands also are used to a moderate level by hikers. Within the BLM's California Desert District, along the northern section of the CMAGR outside the range, special recreation permits are required; these allow specified recreational uses of the public lands and related waters. They are issued as a means to manage visitor use, protect natural and cultural resources, and provide a mechanism to accommodate commercial recreational uses. These permits are authorized by the Land Water Conservation Fund Act. Five types of permits are required: 1) commercial, 2) competitive, 3) vending, 4) individual or group use in special areas, and 5) organized group activity and events (BLM 2011b). Fourteen-day camping limits apply on public land.

The Bradshaw Trail is also in this area and is used by recreational OHV users (BLM 2012a). The BLM also grants permits for land use or special recreation along the trail and allows primitive vehicular camping within 300 feet of the trail except in designated wilderness areas. Seven CDCA wilderness areas are located along and in the vicinity of the Bradshaw Trail, including Big Maria Mountains, Chuckwalla Mountains, Little Chuckwalla Mountains, Orocopia Mountains, Palen-McCoy, Rice Valley, and Riverside Mountains. These wilderness areas are closed to all motorized and mechanical vehicles, including bicycles (BLM 2011b).

The BLM lands to the south of the CMAGR are popular areas for motorized recreational activity. Recreational OHV use in this area is moderate- to high-level and is generally associated with the ISDRA, where it has the greatest impact. The Algodones and Imperial sand dunes systems are located along this area. Mechanized or motorized vehicles are not permitted in the Algodones wilderness area; however, the BLM does grant permits within the ISDRA for all street-legal vehicles used for transportation to recreational sites. This permit is required at all times while in the fee area. Other permits within the ISDRA include commercial, competitive, vending, individual or group use in special areas, and organized group activity and event use. These permits follow the same guidance as the permits within the California Desert District.

Table 2-4 outlines recreational resources within the ROI of the CMAGR.

Table 2-4. Recreation Resources Surrounding the Chocolate Mountain Aerial Gunnery Range

Recreation Area	Primary Access	Facilities	Primary Season
Anza-Borrego Desert State Park	State Route 78 and State Route 86	500 miles of OHV roads, 12 wilderness areas with hiking and biking trails, and 7 areas of historic and cultural interest	October-May
Imperial Sand Dunes	Interstate 8 and State Route 78	160,000 acres interspersed with OHV and campground facilities that include Buttercup, Gecko Road, Glamis, Gordons Well/ Dunebuggy Flats, Mammoth Wash, and Ogilby, Osborne, along both sides of the Coachella Canal and Ted Kipf Road	October-May
Heber Dunes State Vehicular Recreation Area	Interstate 8	343 acres offering OHV facilities, camping, hiking and picnicking	October-May
Ocotillo Wells State Vehicular Recreation Area	State Route 78	80,000 acres offering OHV facilities, hiking and biking trails, and bird watching	October-May

OHV – off-highway vehicle

Sources: BLM 2015, California Department of Parks and Recreation 2015.

**Table 2-4. Recreation Resources Surrounding the
Chocolate Mountain Aerial Gunnery Range (cont'd)**

Recreation Area	Primary Access	Facilities	Primary Season
Salton Sea State Recreational Area	State Route 111	Fishing, birding, camping, windsurfing, boating, hiking, picnicking, and hunting	October-May
Imperial Wildlife Area	State Route 111	Wister Unit, Finney-Ramer Unit, and Hazard Unit; bird blinds, hunting, camping, hiking, and picnicking	12 months

OHV – off-highway vehicle

Sources: BLM 2015, California Department of Parks and Recreation 2015.

3.0 EXISTING ENVIRONMENT

This chapter describes existing physical and biotic environments and the status of their condition on the CMAGR.

3.1 Physical Environments

3.1.1 Earth Resources

For the purposes of this discussion, earth resources include regional geologic setting, geology and soils of the CMAGR.

Regional Geologic Setting

The CMAGR is in the Colorado Desert and Salton Sea geomorphic provinces of California, which are situated in the southwestern portion of the Basin and Range physiographic province. The Basin and Range province (Fenneman 1931) is characterized by generally steep, subparallel, discontinuous mountain ranges that trend northwest to southeast separated by broad, gently sloping to nearly flat, deep alluvial basins. The CMAGR is characterized by the rugged Chocolate Mountains, a range that rises abruptly from broad alluvium-filled desert basins. The Chocolate Mountains stretch more than 60 miles in a northwest to southeast direction and are east of the Salton Sea, south and west of the Chuckwalla Mountains, and southeast of the Orocopia Mountains. The Chocolate Mountains are largely tilted fault blocks composed of the Southern California batholith and Orocopia Schist of Mesozoic age (about 65 to 250 million years ago), overlain by thrust fragments of an older Precambrian metamorphic complex, with minor volcanic and intrusive rocks from the Tertiary period (about 3 to 65 million years ago). Pliocene (about 3 to 5 million years ago) and Pleistocene (about 2 to 3 million years ago) marine and nonmarine sedimentary deposits and Holocene (10,000 years ago to the present day) alluvium occur within the adjacent basins to the east and west.

The Chocolate Mountains occur along the eastern margin of the Imperial Valley and Salton Sea. The Imperial Valley and Salton Sea are in the Salton Trough, a complex pull-apart rift valley, which was formed by the right-lateral motion of the San Andreas transform fault system. That fault system runs along the western boundary of the CMAGR and progresses northwestwardly along the spreading ridge complex of the Gulf of California segment of the Eastern Pacific Rise (Alles 2007). The Salton Trough, an extension of the Gulf of California, is separated from the Gulf of California by the Colorado River delta. The Salton Trough is a Neogene age (23 million years ago to present) basin. This basin has been filled with post-Oligocene interbedded marine and freshwater sediments, which is estimated at over 4 miles thick in some places (Eiders 1979a, b). The great thickness of these sediments demonstrates that considerable sinking of the basin floor has occurred as the sediments accumulated during the past 23 million years.

Late Pleistocene and possibly early Holocene sediments were deposited in ancient Lake Cahuilla. Lake Cahuilla, which occupied the area of the present-day Salton Sea, was a freshwater lake that received inflow from the Colorado River and runoff from the local mountains. A change in course of the Colorado River eliminated most of the inflow to Lake Cahuilla, allowing it to evaporate.

Present-day (Holocene) surficial sediments range from clayey and silty alluvium near the Salton Sea, to alluvial and colluvial fans along the base of the Chocolate Mountains. Wind-blown (eolian) fine sands in some adjacent valleys form spectacular dunes like the Sand Hills, which occur along the southwest corner of the CMAGR. Eolian sand dunes are formed by strong desert winds that transport sand downwind until they form sheets and dunes.

Geology

The Chocolate Mountains within the CMAGR are composed of Proterozoic gneisses and associated rocks that were thrust over the Orocopia schist and subsequently intruded by at least five different granitic plutons (Norris and Webb 1990). The oldest granitic plutons are early Triassic (about 235 million years old), but most are of Mesozoic age. The Proterozoic (about 0.5 to 2.5 billion years ago) gneisses, the Orocopia schist, and the thrust fault have all been intruded by some of the youngest (23 million years) granitic intrusions in California (Norris and Webb 1990). Volcanic rocks of similar Oligocene age (about 23 to 34 million years ago) are widely distributed in the Chocolate Mountains. Miocene age (about 5 to 23 million years ago) fanglomerates, with interbedded basaltic flows, overlie these older rocks and are overlain by Miocene-Pliocene age marine, lagoonal, and nonmarine deposits of the Bouse Formation (Norris and Webb 1990). Figure 3-1 illustrates a geologic overview of the CMAGR.

Late Pliocene, Pleistocene, and Holocene alluvial deposits overlie most of the older formations in the Chocolate Mountains and form dissected piedmont slopes around the range (Norris and Webb 1990). These alluvial fan and terrace deposits have been informally designated as the older, intermediate, and younger alluvium based on their stratigraphic relationships (Dillon 1975). The older alluvium consists of poorly consolidated deposits of sand, silt, and breccia that overlie the Chocolate Mountains. Conglomerate and other rocks and forms dissected aprons and high-standing terraces. The surfaces of these fans and terraces usually have a well-developed coat of desert pavement and desert varnish. The intermediate alluvium overlies the older alluvium and consists of locally derived unconsolidated conglomerate, breccia, and sand that form dissected fans, low terraces, and abandoned channel features. The surfaces of the intermediate alluvium have poorly developed desert pavement and varnish. The younger alluvium consists of sands and gravels occurring as channel fill in the present-day washes, as sheet wash deposits on the alluvial plains, and as wind-blown sands of the Sand Hills that overlie the intermediate alluvium (Dillon 1975). The unconformable relationships between the various alluvial deposits suggest that the base level of erosion has been intermittently lowered by continued subsidence and rifting beneath the Imperial Valley.

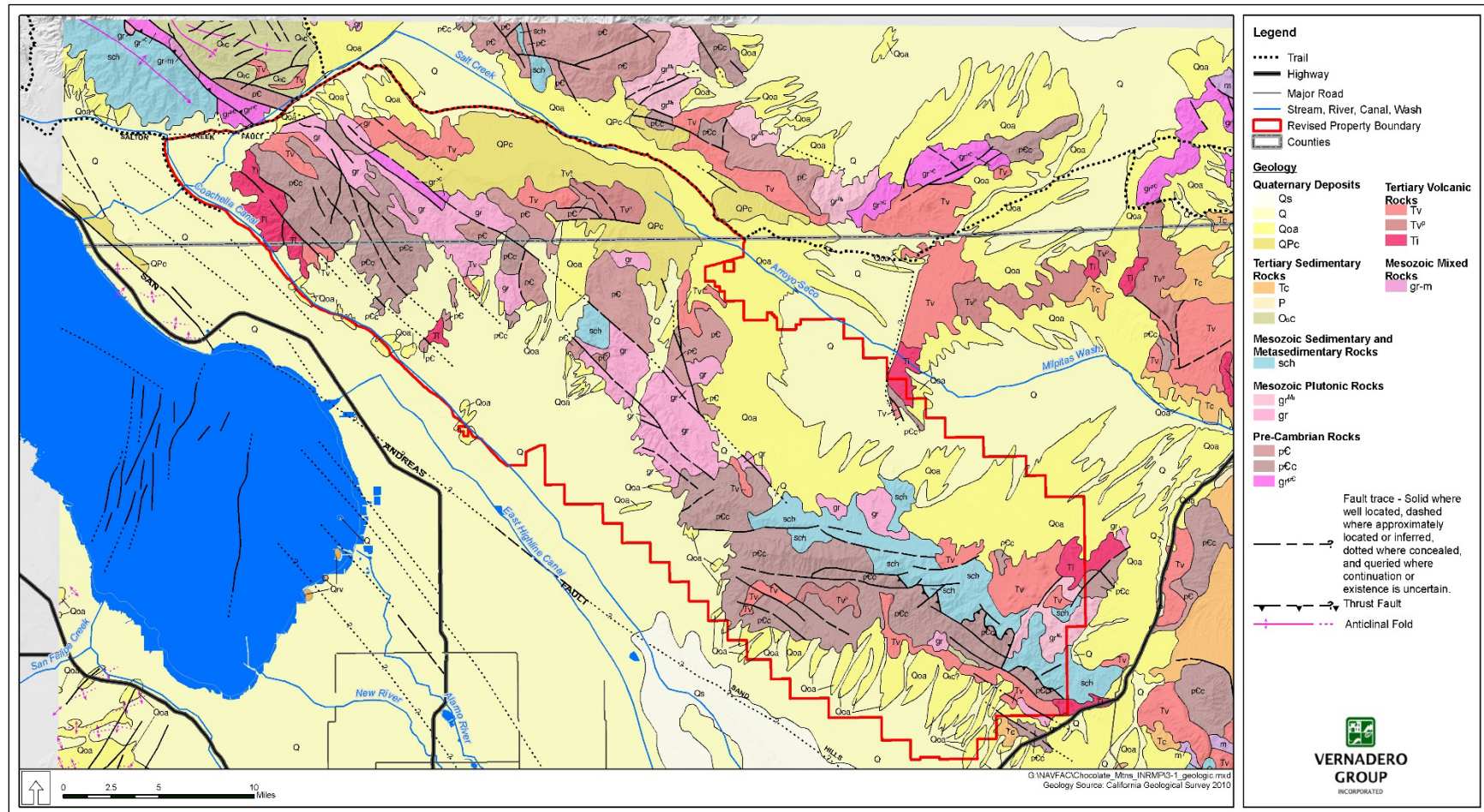


Figure 3-1. Geologic Map of the CMAGR

Soils

The Natural Resources Conservation Service (NRCS) has identified 20 soil series and 7 soil associations (i.e., groups of soil series) within the CMAGR. These soils are described in the State Soil Geographic Database (STATSGO2) developed by the NRCS (2011). The soil associations are shown on Figure 3-2 and summarized in Table 3-1. The Tecopa-Rock Outcrop-Lithic Torriorthents and the Upspring-Sparkhule-Rock Outcrop soil associations include rock outcrops and very shallow mountain soils formed in residuum and colluvium. The Vaiva-Rock Outcrop-Laposa soil association includes hill pediment and fan complex soils on foothills, pediments, and alluvial fans. The Rillito-Gunsight soil association consists of very deep soils on dissected older fans, soils on ancient fans with preserved surfaces, and young to ancient fan soil complexes. The Myoma-Carsitas-Carrizo, Vaiva-Quilotosa-Hyder-Cipriano-Cherioni, and Cajon-Bitterwater-Bitter-Badland soil associations include the following: active fan and wash soils, young fan soil complexes, and fan, lakebed, and badland soil complexes. All soils on the CMAGR are well drained to excessively well drained and primarily consist of sandy and rocky loams derived from igneous and metamorphic rocks.

Table 3-1. CMAGR Soil Associations

Soil Association	Soil Occurrence	Erosion Hazard	
		Water	Wind
Tecopa-Rock Outcrop-Lithic Torriorthents	Mountain soils found on mountain slopes and areas with rock outcrop	Slight	Moderate
Upspring-Sparkhule-Rock Outcrop			
Vaiva-Rock Outcrop-Quilotosa-Laposa	Hill pediment and fan complex soils found on foothills, alluvial fans, and pediments	Slight to moderate	Moderate to high
Rillito-Gunsight	Old alluvial fan soils found on dissected older alluvial fans, in valleys, and on pediments	High to extremely high	High to very high
Myoma-Carsitas-Carrizo	Young alluvial fan and wash soils found in mountain washes, on pediments, and on alluvial fans	Slight to moderate	Moderate to high
Vaiva-Quilotosa-Hyder-Cipriano-Cherioni			
Cajon-Bitterwater-Bitter-Badland			

Source: NRCS 2011

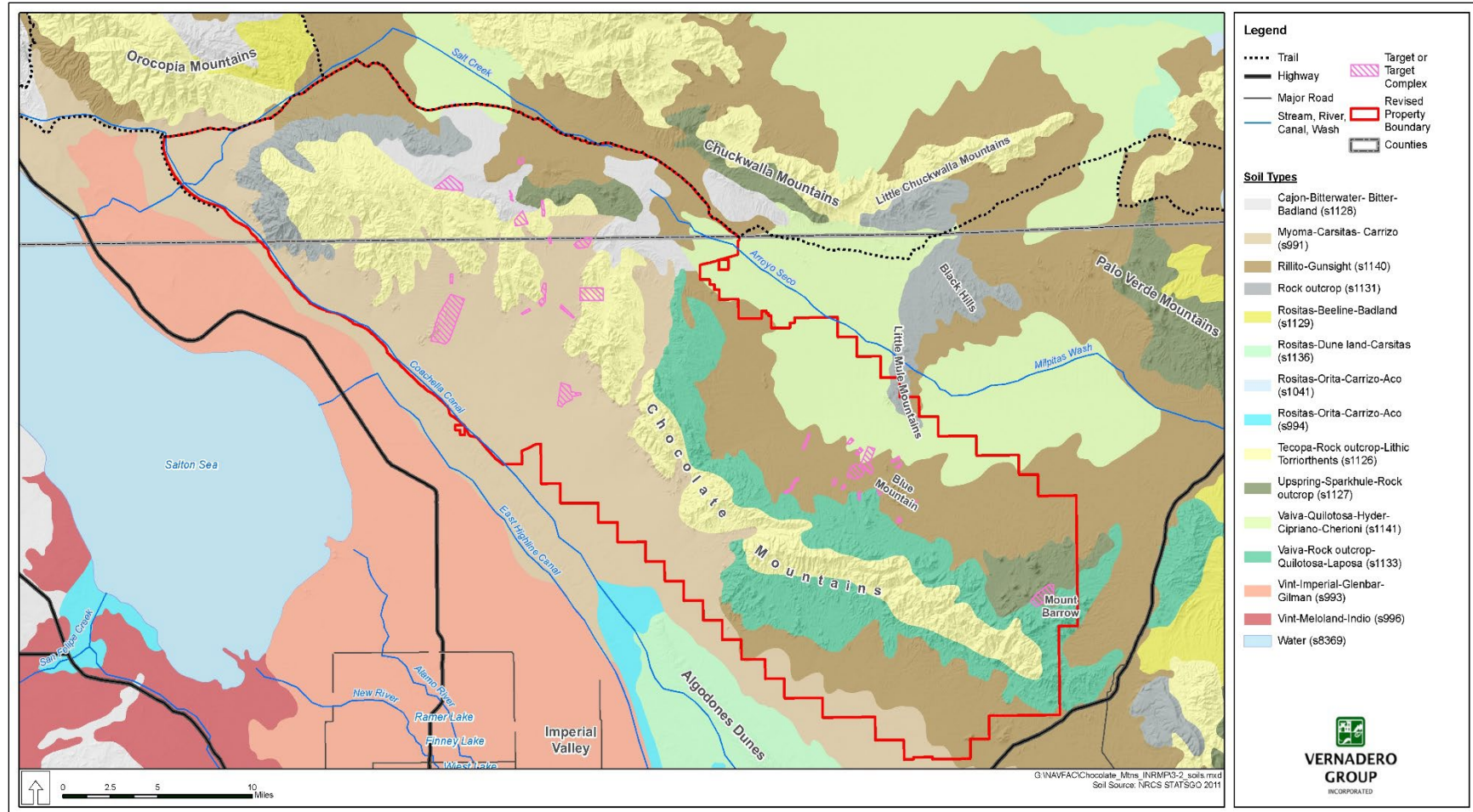


Figure 3-2. Soil Map of the CMAGR

3.1.2 Climate

The CMAGR is in the Salton Sea Air Basin, which includes all of Imperial County and the southwest third of Riverside County. The climate of the CMAGR is desert, with low humidity, high summer temperatures, and moderate winter temperatures.

Data from the Western Regional Climate Center are available for Eagle Mountain, California, which is to the west of the CMAGR near Joshua Tree National Park. Data from this location indicate that July is the hottest month, with an average maximum temperature of 104.9 degrees Fahrenheit (°F) (40.5 degrees Celsius [°C]). January is the month with the lowest average maximum temperature, 64.4°F (18°C). July has the highest average minimum temperature, 82.6°F (28.1°C). The month with the lowest average minimum temperature is January at 44.3°F (6.8°C) (DoN 2010, Western Regional Climate Center 2011).

Average precipitation measured at the Eagle Mountain meteorological station is 3.67 inches per year. The driest months are from April through June. August is the wettest month due to the influence of the summer monsoon rain pattern (DoN 2010).

3.1.3 Climate Change Adaptation Planning

Because climate changes could compromise lands and waters supporting the military mission, the *DoD Integrated Natural Resource Management Plan Implementation Manual* instructs installations to address climate changes upon updating or revising their INRMP (DoD Manual 4715.03). Consequently, the *Climate Adaptation for DoD Natural Resource Managers: A Guide to Incorporating Climate Considerations into Integrated Natural Resource Management Plans* was developed to help installation natural resource managers address changes in the environment due to climate and how to implement this policy guidance (Stein et al. 2019; *Climate Adaptation Guide*). For the DoD, climate adaptation is defined as “adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects.” As such, adaptation planning should be tailored to the mission, resources, and needs of the installation (Stein et al. 2019).

The purpose of the *Climate Adaptation Guide* is to (Stein et al. 2019):

- Serve as a resource for documenting current and future climate at the installation, including an assessment of uncertainties associated with climate projections.
- Identify potential impacts and risks (direct and indirect) that these climatic changes pose to the installation’s natural resources and to mission requirements and sustainability.
- Consider any synergistic effects of climate-related changes in the context of existing natural resource threats and stressors.
- Consider the implications of climate-related changes to INRMP goals, objectives, and actions (current and planned).
- Identify priority projects and actions that could ameliorated climate-related risks and vulnerabilities to installation natural resources and associated mission requirements.

- Link natural resources adaptation concerns and responses with other installation planning processes and documents.
- Identify any regulatory constraints or potential liabilities resulting from climate-related risks to installation natural resources and mission sustainability.

To aid natural resource managers with addressing climate changes, the *Climate Adaptation Guide* presents a generalized, but flexible, INRMP adaptation planning process consisting of the following six steps:

1. Set context for adaptation planning
 - a. Conduct program scoping
 - b. Assemble planning team/engage stakeholders
 - c. Compile background information
2. Assess climate vulnerabilities and risks
 - a. Project future conditions
 - b. Assess vulnerability of target natural resources
 - c. Assess resulting impacts and risks to the military mission
3. Evaluate implications for INRMP goals and objectives
 - a. Evaluate continued achievability of existing goals
 - b. Update climate-compromised goals and objectives
4. Develop strategies and actions to reduce climate risks
 - a. Identify potential adaptation strategies and actions
 - b. Evaluate the effectiveness/feasibility of possible strategies
 - c. Select priority risk reduction measures
5. Implement adaptation actions and projects
 - a. Identify project requirements and dependencies
 - b. Incorporate actions/projects into INRMP implementation table
6. Monitor and adjust adaptation actions
 - a. Define expected results of adaption strategies
 - b. Monitor project effectiveness and ecological responses
 - c. Adjust actions and plans as needed

To further define each of the six steps, as presented in the *Climate Adaptation Guide*, Step 1 focuses on program scoping to ensure that the adaptation planning effort is well tailored to meeting the specific installation-level needs and concerns. This scoping is intended to help managers articulate the installation mission and mission support requirements; clarify existing management goals, objectives, and target natural resources; assemble a planning team and engage the key internal and external stakeholders; and compile relevant information.

Step 2 begins with a general assessment of climate-related impacts that are of concern to the installation in the context of natural resources management. Based on projections of relevant climate variables and conditions, the target natural resources can be assessed for their climate-related vulnerabilities. In turn, those natural resource vulnerabilities can be evaluated for how they may pose risks to sustainment of the installation's military mission.

Step 3 provides an opportunity to examine whether existing management goals and objectives will continue to be feasible and robust in light of projected climatic changes and resource vulnerabilities, or whether adjustments or modifications are warranted to ensure that these goals are climate-informed, forward-looking, and achievable.

Step 4 allows managers to think creatively in identifying measures capable of reducing key climate vulnerabilities and enhancing installation resilience. Potential strategies and actions can then be evaluated and prioritized based on their efficacy from multiple perspectives, including feasibility, cost-effectiveness, and capacity to achieve desired (and ideally climate-informed) goals and objectives.

Step 5 focuses on the incorporation of selected risk reduction measures into the INRMP and execution of both newly identified actions as well as adjustment of existing projects to make them more climate resilient.

Finally, Step 6 encourages managers to employ an adaptive management framework by identifying performance indicators and thresholds for those indicators that would trigger needed adjustments or changes in strategy. This stage of the process is key to applying an iterative risk management approach. Climate-informed monitoring of project results and ecological conditions allow managers to determine when subsequent risk reassessments and adaptation planning may be needed. As appropriate, lessons learned, progress, and adaptive planning adjustments should be tracked and discussed during the annual INRMP Metrics meeting with regulatory partners (Stein et al. 2019).

The *Climate Adaptation Guide* provides a set of detailed worksheets to support installation-level applications of the six-step INRMP adaptation planning process. The worksheets were sequentially designed; however, it is not necessary to use the worksheets in their entirety or even fill out all cells within any worksheet. The worksheets are meant to be flexible and can be modified to suit the needs of the installation. Electronic versions of the worksheets, in both Microsoft Excel and Word, can be found at www.denix.osd.mil/nr/DoDAdaptationGuide (Stein et al. 2019). Examples of worksheets for each of the six steps related to CMAGR are provided below.

Step 1 – Worksheet 1.1 Installation Mission and Requirements

Mission and Mission Support Components What are the core mission and mission support components for the installation?	Critical Mission Requirements What are the built and natural features/conditions critical to carrying out and sustaining this installation mission component?
<i>Notes: None to add.</i>	<i>Notes: None to add.</i>
Target simulations and other earthwork features	Field Ammunition Supply Point
Core weapons impact area	Unmanned Aircraft System Strip
Secondary weapons impact area	Observation Post
Weapons delivery containment area	Artillery Firing Area
Ground support sites	Camp Billy Machen

Mission and Mission Support Components What are the core mission and mission support components for the installation?	Critical Mission Requirements What are the built and natural features/conditions critical to carrying out and sustaining this installation mission component?
Camp Billy Machen and associated static ranges	Bivouac and Work Area
SWATs 4 and 5	Target Simulations
Additional training, support, and range access control areas	Weapons Impact Areas
Range road corridors	Roads and Trails

SWAT – Special Warfare Training Area

Step 1 – Worksheet 1.2 Target Resources and Existing Goals

Target Natural Resources What are the natural resources features (species, habitats, ecosystem processes, etc.) that are the focus of this adaptation planning effort?	Goals/Objectives What are the existing INRMP goals and objectives for the target natural resources?	Associated Program Element(s) What INRMP program elements are associated with each of the target natural resources?
<i>Notes: "Target natural resources" are the intended beneficiaries of INRMP conservation efforts. Only a subset of target resources that are of particular management interest or concern typically are evaluated in a given adaptation planning cycle. List each target resource on a separate row.</i>	<i>Notes: Describe in as much specificity as possible existing conservation goals or management objectives that apply to the individual target natural resources.</i>	<i>Notes: None to add.</i>
Desert tortoise	Presented in Section 4.4.1 in the 2022 INRMP.	Endangered Species Act, Critical Habitat, and Recovery Plan
Free-roaming equine species	Presented in Section 4.9 in the 2022 INRMP.	Wild Free-Roaming Horse and Burro Act
Sonoran pronghorn	Presented in Section 4.4.2 in the 2022 INRMP.	Endangered Species Act and Recovery Plan

INRMP – Integrated Natural Resources Management Plan

Step 1 – Worksheet 1.3 Planning Scope and Background Information

Geographic Scope What is the spatial context for addressing climate change in the installation's INRMP planning?	Stakeholders/Partners Who are the key stakeholders and participants to engage in the adaptation planning process, both within DoD and externally?	Available Information/Expertise What existing studies or resources are available for understanding regional or local climate projections and natural resource responses?
<i>Notes: Shifting climatic conditions may require that adaptation planning considers an even larger geographic area, or areas that might not otherwise have been considered relevant.</i>	<i>Notes: To the extent feasible, identify specific individuals or organizations. Involving climate scientists and other relevant experts early on may help installations navigate the process more effectively.</i>	<i>Notes: Existing information can include regional climate summaries, such as included in the national Climate Assessment, state-level assessments, and other adaptation plans.</i>
Chocolate Mountain Aerial Gunnery Range	U.S. Marine Corps, Bureau of Reclamation, and Bureau of Land Management	California's Fourth Climate Change Assessment: Inland Deserts Region Report (Hopkins 2018)

INRMP – Integrated Natural Resources Management Plan; **DoD** – Department of Defense

Step 2 – Worksheet 2.1 Climate Concerns and Projections

Key Climate Concerns What are the key climate change-related impacts or threats to the installation, and more specifically for the target natural resources?	Climatic Factors What are the climatic factors or variables related to those concerns, and which are ecologically relevant for your installation and the resources you are managing?	Historical/Current Conditions What are the historical/current values for this climate factor?	Trend What is the trend or directionality for this factor, if known?	Projections What are available projections for this variable?	Confidence/Uncertainty What is the level of confidence or certainty in the trend or magnitude of change for this variable (i.e., High, Medium, or Low)?
<i>Notes: Such concerns could include increased drought, change in fire frequency and severity, changes in flood frequency and severity,</i>	<i>Notes: These include physical variables (e.g., air and water temperatures, precipitation, sea levels, flood levels and frequency), and they should specify</i>	<i>Notes: Identifying current values may show where conditions have already changed.</i>	<i>Notes: Knowing the directionality or trend of a climatic factor can be informative, even without detailed projections of rate or magnitude.</i>	<i>Notes: Multiple scenarios of future conditions are often appropriate (e.g., low vs. high) as are projections for different timescales (e.g., 30-50</i>	<i>Notes: Some climatic changes have higher certainty than others. Uncertainties may exist for directional changed, rates or change, etc.</i>

Key Climate Concerns What are the key climate change-related impacts or threats to the installation, and more specifically for the target natural resources?	Climatic Factors What are the climatic factors or variables related to those concerns, and which are ecologically relevant for your installation and the resources you are managing?	Historical/Current Conditions What are the historical/current values for this climate factor?	Trend What is the trend or directionality for this factor, if known?	Projections What are available projections for this variable?	Confidence/Uncertainty What is the level of confidence or certainty in the trend or magnitude of change for this variable (i.e., High, Medium, or Low)?
<i>sea-level rise and associated shoreline or beach loss.</i>	<i>averages and extremes (where relevant).</i>			<i>years vs. 70-100 years).</i>	
Stronger and more frequent high wind speeds	Dried-out vegetation and limited, ephemeral water resources	High winds are typically seasonal	Year-round instead of seasonal	Unknown	Seems to be a trend, but more data are needed to determine any actual trends
Drought	Lack of water for plants and wildlife	Drought cycles are historical occurrences in southern California	Longer and/or more frequent droughts	Ongoing	Have already experienced severe and extreme drought in California
Rain regime changes	Plant growth period timing changes	None	More intense rainfall events, but less overall rain	Ongoing	Seems to be a trend, but more data are needed to determine any actual trends
Overall warmer temperatures	Dried-out vegetation and limited, ephemeral water resources	High daytime temperatures in the summer months have been a common occurrence	More days over 100 degrees Fahrenheit	Ongoing	Have already experienced record high temperatures for the region
Information Sources List sources of information used to fill in this table.		<i>California's Fourth Climate Change Assessment: Inland Deserts Region Report (Hopkins 2018)</i>			

Step 2 – Worksheet 2.2 Climate Vulnerabilities of Target Natural Resources

Target Natural Resource(s) What are the target natural resources to be evaluated, from Worksheet 1.2?	Climate-Related Threats			Other Threats What existing or “nonclimate” threats to the resource may be exacerbated by or amplified due to projected changes in climatic factors?	Degree/Reason for Vulnerability Rate the relative vulnerability (e.g., Very High, High, Medium, Low) and describe the reason for that rating.
	Sensitivity How and to what degree might this resource respond (negatively or positively) to expected climate-related changes?	Exposure To what degree is the resource likely to overlap with and be exposed to conditions to which it is sensitive?	Adaptive Capacity Does the target resource have the ability to accommodate, cope with, or adjust to projected changes in climatic conditions? If so, how?		
<i>Notes: Select all or a subset of the target resources listed in Worksheet 1.2. These may fall within one or more program elements.</i>	<i>Notes: Understanding innate sensitivities of the resource help identify which climate-related changes should be considered under the exposure component of vulnerability.</i>	<i>Notes: Drawing on Worksheet 2.1, determine which climate-related changes will most affect the target resource.</i>	<i>Notes: If possible, identify both intrinsic and extrinsic/ external factors that might affect the ability of the species to adjust to/accommodate changes.</i>	<i>Notes: Be as clear as possible about the specific linkages between the climatic factors and nonclimate threats.</i>	<i>Notes: In addition to assessing the relative vulnerability, documenting the reasons for that vulnerability helps in development of risk reduction strategies. It also may be useful to highlight any uncertainties in the assessment.</i>
Desert tortoise	Activity/foraging timing changes	Rain regime changes, plant growth period timing changes, drought, warmer temperatures	Yes, but slowly, possibly taking several years to decades	Vehicular strikes	None to Very High, depending on time of year (e.g., activity or foraging)
Free-roaming equine species	Seek irrigated vegetated areas or guzzlers	Rain regime changes, plant growth period timing changes, drought, warmer temperatures	Yes, can change seasonally	Vehicular strikes, low-flying aircraft, firing range	Overall Low because individuals can easily move or relocate
Sonoran pronghorn	Seek irrigated vegetated areas or guzzlers	Rain regime changes, plant growth period timing changes, drought, warmer temperatures	Yes, can change seasonally	Vehicular strikes, low-flying aircraft, firing range	Overall Low because individuals can easily move or relocate

Step 2 – Worksheet 2.3 Military Mission Risks from Natural Resource Vulnerabilities

Vulnerabilities of Target Natural Resources List the most consequential natural resource vulnerabilities identified in the last column of Worksheet 2.2.	Risks to Installation Mission Requirements How might this natural resource vulnerability affect the ability of the installation to deliver its military mission (e.g., training, testing, etc.) and long-term sustainment?	Degree of Risk Rate the relative risk this vulnerability poses to the installation's ability to meet its military mission requirements (e.g., Very High, High, Medium, Low).
<i>Notes: None to add.</i>	<i>Notes: None to add.</i>	<i>Notes: None to add.</i>
Changes to activity timing and foraging for the desert tortoise	Scheduling of avoidance activities during training could be altered due to changes in desert tortoise foraging and activity periods.	Moderate, as scheduling of ground activities and air-to-ground training are critical to meeting the mission requirements.

Step 3 – Worksheet 3 Climate Implications for INRMP Goals and Objectives

INRMP Goals to Evaluate What are the existing goals for the target natural resources under consideration, from Worksheet 1.2?	Climate Implications for Existing Goals/Objectives Based on climate concerns (Worksheet 2.1), vulnerabilities (Worksheet 2.2), and mission risks (Worksheet 2.3), how might your ability to achieve existing goals be compromised?	Climate-Informed Goals/Objectives Are there any refinements or updates that may be needed to craft a more climate-informed version of the goal or objective?
<i>Notes: None to add.</i>	<i>Notes: Consider climate implications to the "what," "why," "where," and "when" of the goal. At this stage, assume continuation of existing management practices. If necessary, this review can be repeated following Step 4 to determine if modified or new management practices might change the outcome.</i>	<i>Notes: Consider needed updates or refinements to goals to take future climate into account. Craft possible modifications based on the "what," "why," "where," "when" framework for goal evaluation.</i>
Maintain and/or manage known populations	Reduced forage and available water sources for target sensitive species	An understanding of changes in vegetation cover and composition that provides forage for target species

INRMP – Integrated Natural Resources Management Plan

Step 4 – Worksheet 4.1 Identification of Possible Adaptation Strategies and Actions

Vulnerability/Risk What specific natural resource vulnerability (Worksheet 2.2) or mission risk (Worksheet 2.3) is being addressed?	Risk Reduction Strategies What strategies could reduce these vulnerabilities and risks?	Supporting Actions/Projects What actions or projects could be carried out to realize a given strategy?	Rationale and Assumptions How is this strategy or set of actions likely to reduce these vulnerabilities or risks?
<i>Notes: Describe the specific vulnerability (to target natural resource) or risk (to military mission) to be addressed by the strategy and their associated actions/projects.</i>	<i>Notes: List possible strategies for reducing the vulnerability or risk. Strategies can be general in nature, since more detailed supporting actions/projects are listed at right.</i>	<i>Notes: For each strategy identified at left, list the actions or projects-or suite of actions-that could help to achieve its intended risk reduction benefits. Be as specific as possible. These can be existing, modified, or new actions/projects.</i>	<i>Notes: Describe why you think this strategy (and its associated actions/projects) may be capable of reducing the stated vulnerabilities and risks. Note any assumptions or uncertainties.</i>
Changes to activity timing and foraging for the desert tortoise	Conduct vegetation surveys to determine the distribution of native and nonnative plant species, including those that provide forage for desert tortoise and other target species	Acquire reliable baseline data on the presence, distribution, and abundance of invasive and nonnative plant species	Determining the locations and species of nonnative plants within suitable desert tortoise habitat would allow for targeted treatment
Changes to activity timing and foraging for the desert tortoise	A reduction in the cover of nonnative species should provide a greater opportunity for native plant species cover even under declining precipitation conditions	Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness	Allows for proper planning of treatment activities
Changes to activity timing and foraging for the desert tortoise	Provide vegetation management to ensure adequate forage is available	Treat and monitor areas most likely to impact ecosystem health or mission readiness	Greater cover of native plant species provides more available forage for desert tortoise

Step 4 – Worksheet 4.2 Evaluation and Selection of Adaptation Strategies and Actions

Focus of Worksheet:			
Strategies/Actions to Evaluate List strategies or actions to be evaluated in columns at right. These should carry over from Worksheet 4.1. Add columns for additional strategies/actions as needed.	Strategy/Action 1 Acquire reliable baseline data on the presence, distribution, and abundance of invasive and	Strategy/Action 2 Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely	Strategy/Action 3 Treat and monitor areas most likely to impact ecosystem health or mission readiness.

Focus of Worksheet:				
		nonnative plant species.	to impact ecosystem health or mission readiness.	
Criteria for Evaluation Identify and list below relevant criteria for evaluating/comparing proposed strategies/actions. Add rows for additional criteria as needed.		Baseline surveys were conducted	Detailed survey results of nonnative and invasive plant species were provided	Treatment of nonnative and invasive plant species was prioritized
<i>Notes: Choosing among adaptation strategies will depend on a range of factors, depending on the installation's particular needs, interests, and resources. Major categories below are illustrative.</i>				
Effectiveness at meeting climate-informed natural resource goals		Moderate	Moderate	Moderate
Effectiveness in meeting other installation objectives		High	High	High
Feasibility		High	High	High
Recommend for Inclusion in INRMP?		Yes	Yes	Yes

INRMP – Integrated Natural Resources Management Plan

Step 5 – Worksheet 5 Implementation of Adaptation Strategies/Actions

Recommended Strategies/Actions List strategies/actions recommended for incorporation into the INRMP, from Worksheet 4.2.	Responsible Parties Who would have responsibility for or be involved in implementing the strategy/action?	Relationship to Existing INRMP Strategies Does this fit within a current INRMP effort, or is it a new activity/project?	Project Planning Needs What preparations or requirements would be necessary before carrying out the recommended strategies/actions?	Timing and Sequencing When should the action/project be implemented (immediately or at some future time)?
<i>Notes: None to add.</i>	<i>Notes: identify whether this project could be done in house, via contract, or through partnering.</i>	<i>Notes: None to add.</i>	<i>Notes: List permitting, funding, design, methods development, scientific research, etc. Are there any unique implementation challenges (e.g., legal, social, technical, etc.)?</i>	<i>Notes: Identify when the project should be started. Consider dependencies that may require project sequencing, or any ecological thresholds that may trigger needed action.</i>

Recommended Strategies/Actions List strategies/actions recommended for incorporation into the INRMP, from Worksheet 4.2.	Responsible Parties Who would have responsibility for or be involved in implementing the strategy/action?	Relationship to Existing INRMP Strategies Does this fit within a current INRMP effort, or is it a new activity/project?	Project Planning Needs What preparations or requirements would be necessary before carrying out the recommended strategies/actions?	Timing and Sequencing When should the action/project be implemented (immediately or at some future time)?
Acquire reliable baseline data on the presence, distribution, and abundance of invasive and nonnative plant species	CMAGR and NAVFAC	This fits within a current INRMP effort	Adequate funding; botanical expertise, field mapping expertise	Immediately
Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness	CMAGR and NAVFAC	This fits within a current INRMP effort	Adequate funding; botanical expertise, field mapping expertise	Immediately and then updated periodically following treatment activities
Treat and monitor areas most likely to impact ecosystem health or mission readiness	CMAGR and NAVFAC	This fits within a current INRMP effort	Adequate funding; qualified pesticide applicator	Consistently implemented annually in the future to maintain control

INRMP – Integrated Natural Resources Management Plan; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **NAVFAC** – Naval Facilities Engineering Systems Command

Step 6 – Worksheet 6 Climate-Informed Monitoring and Evaluation

Adaptation Strategies/Actions List the strategies, actions, or projects being implemented that will be the subject of monitoring and evaluation.	Expected Outcomes Include both near- and long-term outcomes expected for the action or project.	Indicators No further description(s) to add.	Management Triggers What thresholds (based on your indicators) might cause you to adjust management practices or rethink strategies?
<i>Notes: These should carry over from Worksheets 4.2 and 5.</i>	<i>Notes: Near-term monitoring and evaluation may need to focus on expected outcomes of interim activities, such as success of planning efforts.</i>	<i>Notes: These may include process- and output-based indicators.</i>	<i>Notes: None to add.</i>

Adaptation Strategies/Actions List the strategies, actions, or projects being implemented that will be the subject of monitoring and evaluation.	Expected Outcomes Include both near- and long-term outcomes expected for the action or project.	Indicators No further description(s) to add.	Management Triggers What thresholds (based on your indicators) might cause you to adjust management practices or rethink strategies?
Acquire reliable baseline data on the presence, distribution, and abundance of invasive and nonnative plant species	Baseline data on nonnative plant species distribution and abundance at CMAGR	Detailed list and map of nonnative plant species	None
Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness	Updated data on nonnative plant species distribution and abundance at CMAGR with prioritized treatment recommendations	Updated list and map of nonnative plant species with revised treatment recommendations	Mapping efforts do not observe new populations of nonnative plant species
Treat and monitor areas most likely to impact ecosystem health or mission readiness	Reductions in the abundance and distribution of target nonnative plant species	Nonnative plant species mortality and increased native plant species cover	Treatment efforts do not increase native plant species cover and valuable forage for desert tortoise

CMAGR – Chocolate Mountain Aerial Gunnery Range

The *Climate Adaptation Guide* provides an overview of climate risks and a review of options for incorporating climate concerns, as well as a summary of climate and adaptation considerations for individual INRMP program elements. This guide identifies four primary climate-related factors: rising global temperatures, changing precipitation patterns, increasing frequency or intensity of extreme weather events, and rising sea levels and associated storm surge. Due to these factors, there have been shifts in species ranges, breeding seasons, migrations, and other life-cycle events (Stein et al. 2019). More specifically related to inland desert regions (all of Imperial County and the desert portions of Riverside and San Bernardino counties), the climate is becoming more extreme. By the end of the century, it is projected that daily average high temperatures will increase between 8 and 14 degrees Fahrenheit. Other projections include increased variability of rainfall rates, with extreme drought and extreme wet events becoming more common. Due to the increased frequency of drought and wet events, the risk of flash floods and wildfires will also increase. “Biodiversity hotspots are found at high elevation, in oases, and sand dunes that provide a climatic refuge against extreme heat and aridity that characterizes sandy lowland areas (bajadas). These hotspots are threatened by climate change as well as other land-use pressures, and identifying and protecting appropriate climate refugia is likely to be the best strategy for conservation” (Hopkins 2018).

As an example, and specifically related to the desert tortoise, climate change will most likely alter tortoise activity over an undetermined amount of time. The change of rain regime is

anticipated to affect tortoise activity to a larger extreme than rising temperatures. Overall, if rain regimes change from less in summer and more in winter, then there will be less and possibly a shorter plant growth period in fall and more, possibly longer plant growth period in spring. If this comes to be, then desert tortoise activity (e.g., foraging and breeding) will most likely shift to being more active in late winter and early spring, with minimal (if any) activity in fall. Therefore, focused desert tortoise surveys would need to shift to better document presence to avoid or minimize any potential impacts. At this time, it is difficult to determine if, or to what extent, this could affect the military mission and the CMAGR Biological Opinions (BOs) that are currently in place.

One of the major geographic features of the inland desert region is the Salton Sea, which is immediately west of CMAGR. The Salton Sea is California's largest lake that is maintained by agricultural runoff. Due to decreasing levels of this runoff, the sea is shrinking, which exposes more of the playa, which in turn most likely becomes a significant source of dust and subsequent air pollution. Dust emissions from the Salton Sea are possibly linked to high rates of childhood asthma and cardiovascular disease (Hopkins 2018).

Some climate risks for the inland desert regions include (Hopkins 2018):

- Extremely high maximum temperatures are expected to occur. This will most likely affect CMAGR.
- The fate of the Salton Sea is a critical determinant of future environmental quality. This will most likely affect CMAGR.
- Renewable energy development will have big impacts on the economy and infrastructure. This will most likely *not* affect CMAGR.
- Continuing current land use/development patterns (i.e., housing development in the regions to compensate for lack of development on the coast) will require increased energy for cooling to compensate for a rise in extremely high temperatures. This will most likely affect CMAGR.
- Higher temperatures will exacerbate water stress in an already very water-limited region. This will most likely affect CMAGR.
- Changing water availability is a key determinant of the future for ecological and agricultural systems. This will most likely affect CMAGR.
- Populations in the inland desert region are highly vulnerable to the effects of climate change. This will most likely affect CMAGR.
- Tourism is a major economic driver that is likely to be threatened by a changing climate. This will most likely *not* affect CMAGR.

Seasonal rainfall patterns are projected to change; winter precipitation is anticipated to increase while summer precipitation is anticipated to decrease. The probability of flash floods will most likely increase due to more intense rainfall events and drier soils because dry soils do not absorb water as readily, which causes high runoff rates (Hopkins 2018).

3.1.4 *Water Resources*

Water resources are defined as sources of water available for use by humans, flora, or fauna, and include surface water, groundwater, near-shore waters, and wetlands. Surface water resources include stormwater, lakes, streams, rivers, and springs. Groundwater is defined as any source of water beneath the ground surface. Surface water and groundwater may be used for potable water, agricultural irrigation, industrial, and recreational purposes.

Water Resources Setting

The CMAGR is within the Salton Sea Transboundary and Imperial Reservoir watersheds. Surface water is extremely scarce on the CMAGR; however, and there are no naturally occurring perennial surface water features on the range (Figure 3-3). Within the CMAGR, the Salton Sea Transboundary watershed is composed of portions of four local watersheds arranged from northwest to southeast. They are the Salt Creek, Imperial Valley-Frontal Salton Sea, Alamo River, and Algodones Dunes-Chocolate Mountain watersheds. Ephemeral surface water drainages within these CMAGR watersheds flow seasonally and discharge to the Salton Sea. The Imperial Reservoir watershed within the CMAGR consists of the Arroyo Seco-Upper Milpitas Wash and Lower Milpitas Wash. Ephemeral surface-water drainages within these CMAGR watersheds flow seasonally and discharge to the Colorado River. Perennial surface waters are present outside the CMAGR and include the Salton Sea, New River, Alamo River, and Colorado River. The Salton Sea, New River, and Alamo River are largely sustained by irrigation return flows (DoN et al. 2013).

Surface Water

Surface water on the CMAGR is derived from infrequent rainfall events that produce localized flash flooding and temporary surface water runoff, especially during thunderstorms in the monsoon seasons (Figure 3-3). Rainfall averages less than 5 inches per year, and the pan evaporation rate is 100 inches per year, resulting in a net water loss of up to 95 inches (DoN et al. 2013). The combination of low precipitation and high evaporation prevents surface water from infiltrating deeply into CMAGR soils. Therefore, for most of the year, the desert washes on the CMAGR are dry. During heavy rainstorms, these washes drain surface water runoff from the surrounding landscape. This runoff can be captured in natural catchments such as tinajas (natural bedrock depressions), sand tanks, charcos (mud holes), and playa lakes. Natural springs or seeps are found in some locations on the CMAGR; however, for most of the year they are dry. Groundwater discharges from bedrock joints and fractures within the Chocolate Mountains also are ephemeral and short lived, occurring only after a rainfall event.

Surface water drainages are divided by the Chocolate Mountains. On the western and some of the eastern slopes, runoff drains toward the Salton Sea (Figure 3-3). Runoff from the east slope of the northern Chocolate Mountains drains to Salt Creek Wash which, in turn, drains to the Salton Sea. Runoff from the east slope of the central portion of the Chocolate Mountains drains to the Salton Sea by way of several mountain passes, the largest of which is Iris Wash. Runoff from the east slope of the south portion of the Chocolate Mountains drains northeastward into the Arroyo Seco and Milpitas washes and then southeastward to the Colorado River.

Artificial tanks, wildlife water sources (guzzlers) and tinajas are the only open water sources within the CMAGR available to wildlife. The artificial water sources have largely been constructed by Desert Wildlife Unlimited in cooperation with the CDFW, USFWS, Navy, and USMC and are designed to collect rainwater using concrete basins and/or natural topography to support on-range wildlife populations. Historically, the CDFW managed 27 existing guzzlers within the CMAGR that provide a supplemental source of water for desert bighorn sheep and mule deer in the Chocolate Mountains (BLM 2009). In 2009, the USMC, BLM, USFWS, and CDFW approved the installation of eight additional guzzlers, four of which have been completed (BLM 2009). The storage capacity of the tanks and guzzlers ranges from 1,000 to 24,000 gallons. Water can be retained in these systems for several months to more than one year, depending on weather and wildlife use. The tinajas are ephemeral pools that develop after seasonal storm events in narrow canyons where depressions in exposed bedrock collect and hold rainfall. Within the CMAGR, Tortuga Springs is the only aquifer-fed natural spring; however, this spring has been reported as dry since 1976 (Lesicka 1990). Beal Well and Salvation Well were powered by windmills that are no longer operational or maintained; however, both drinkers have been converted to catch rainwater and are active working guzzlers.

Perennial surface water is present in the Coachella Canal, along the western range boundary. Along the length of the CMAGR boundary, portions of the Coachella Canal are lined with concrete to minimize water losses. The water in the canal is kept separate from local stormwater runoff by a series of siphons that allow the canal to flow beneath stormwater channels. Stormwater is directed toward the siphons by a series of low earthen dikes on the uphill side of the canal. Water in the Coachella Canal is derived from the Colorado River and is diverted at the Imperial Dam, approximately 20 miles upstream from Yuma, Arizona.

Beneficial uses of surface water within the region are largely associated with irrigated agriculture, mining, geothermal energy production, and recreational use (primarily the Salton Sea). Agricultural use is the predominant beneficial use of water in the region. Surface waters in the region also provide habitat for fish and wildlife. Most of the surface water used is imported via canals from the Colorado River. According to the Water Quality Control Plan for the Colorado River Basin (California Regional Water Quality Control Board 2006), the potential existing and intermittent beneficial uses of perennial, intermittent, and ephemeral streams and washes is agriculture, municipal use, industry, groundwater recharge, contact and noncontact recreational use, warm freshwater habitat, and wildlife habitat. Beneficial uses of surface waters within the CMAGR are largely limited to groundwater recharge and wildlife habitat.

Groundwater

Groundwater resources within the CMAGR are extremely limited. Bedrock areas of the Chocolate Mountains have limited groundwater potential and are classified by the California Department of Water Resources (CDWR) as non-water-bearing. Shallow wells in bedrock areas are assumed to tap waters in thin alluvium or fractured bedrock. The water-bearing potential of the bedrock formations is highly limited. Infiltration into bedrock formations on the CMAGR is expected to be significantly less because of the steep slopes of the Chocolate Mountains, which increase runoff and decrease percolation. More extensive groundwater resources are present in

the down-faulted sedimentary basins east and west of the Chocolate Mountains. Recharge to the groundwater basins is derived chiefly from infiltration of runoff along the base of the Chocolate Mountains; however, high evaporation, low rainfall, and rapid runoff result in minimal groundwater recharge. The amount and quality of groundwater stored in the groundwater basins underlying the CMAGR are not known because very few wells have been drilled on the range.

The CMAGR is underlain by portions of four groundwater basins as defined by the CDWR (2003). These basins are part of the Colorado River Hydrologic Region. Figure 3-4 shows the groundwater basins underlying the CMAGR, which include, from north to south, the Chocolate Valley, East Salton Sea, Amos Valley, and Arroyo Seco Valley basins.

There are currently no active water supply wells on the CMAGR. Groundwater use beneath the CMAGR is precluded by Public Water Reserve 65. Water for CMAGR activities is transported to the range. Groundwater resources within the CMAGR are extremely limited. Little rainfall, high evaporation, and rapid runoff result in minimal groundwater recharge. Recharge has been estimated at 6.3 to 9.5 millimeters per year (0.24 to 0.37 inches per year), or 10 to 14 percent of precipitation (CDM Federal Programs Corporation 2003).

More extensive groundwater resources are present in the down-faulted sedimentary basins east and west of the Chocolate Mountains. The most important hydrologic features of the groundwater basins are the alluvial fans. The aquifers in the intermontane sedimentary basins receive most of their recharge through the coarse sediments deposited in the fans, according to the U.S. Geological Survey (USGS 1995). Sinks are areas where runoff from the ephemeral desert washes is temporarily impounded against sand dunes; these form locally important recharge features along the northeast margin of the Sand Hills, along the southwestern corner of the CMAGR (Loeltz et al. 1975).

Several shallow wells dug in the north portion of the CMAGR were surveyed by the USGS in 1975 and found to have groundwater at depths of 10 to 38 feet below ground surface (Loeltz et al. 1975). Along the southwest border of the CMAGR, groundwater is recharged by leakage from the All-American Canal and, historically, was recharged from the Coachella Canal before it was lined. The USGS surveyed two wells along the canals within the CMAGR, completed at total depths of 550 and 1,000 feet, with water levels of 25 and 154 feet below ground surface. The USGS studies indicate that groundwater in the vicinity of the canals is chemically similar to Colorado River water and that groundwater elevations are higher along the canals, indicating that groundwater is locally derived from canal leakage (Loeltz et al. 1975). Not enough groundwater data are available for the area east of the Coachella Canal to develop potentiometric contours for the water table or characterize the groundwater quality beneath the CMAGR.

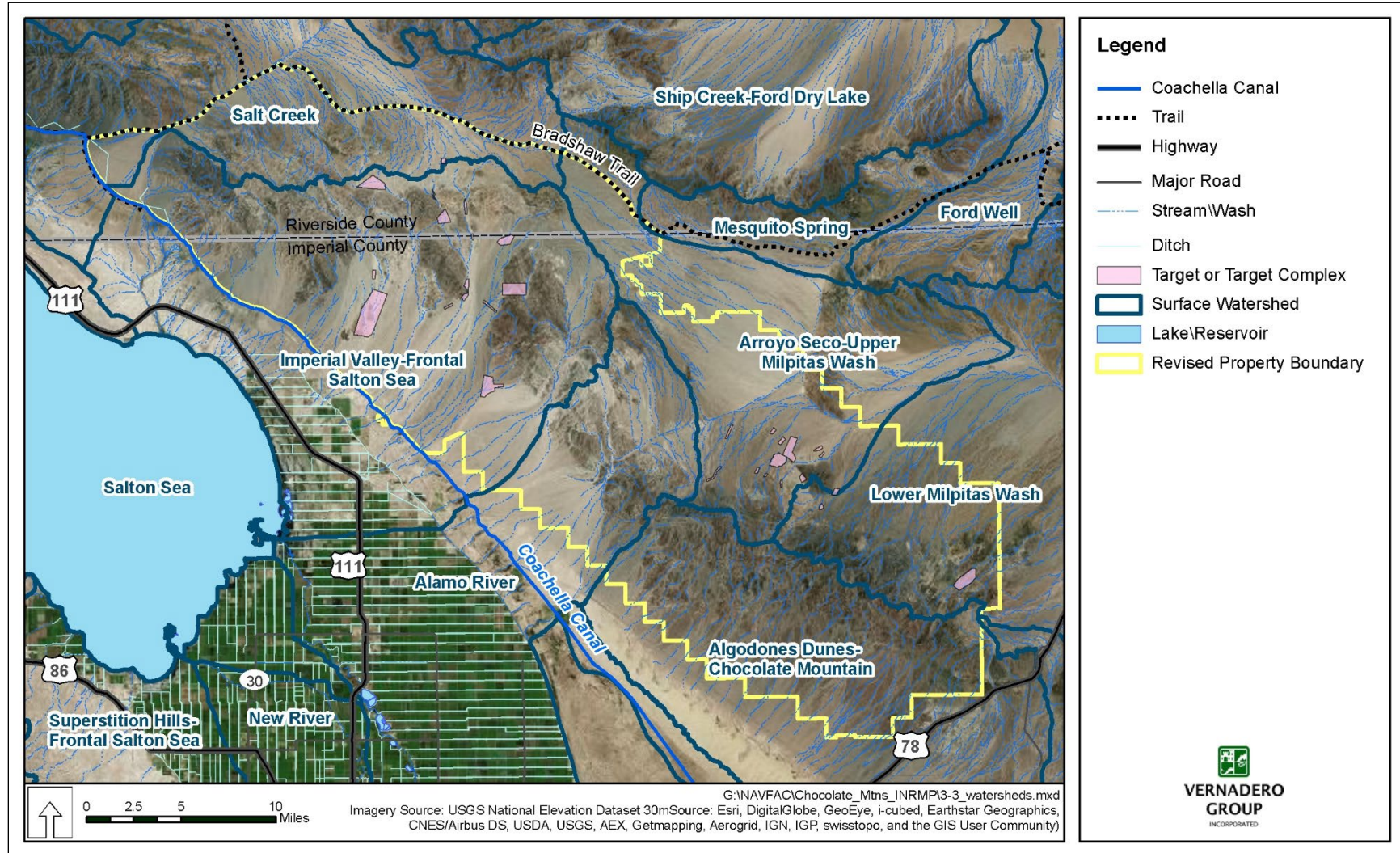


Figure 3-3. Surface Watersheds of the CMAGR

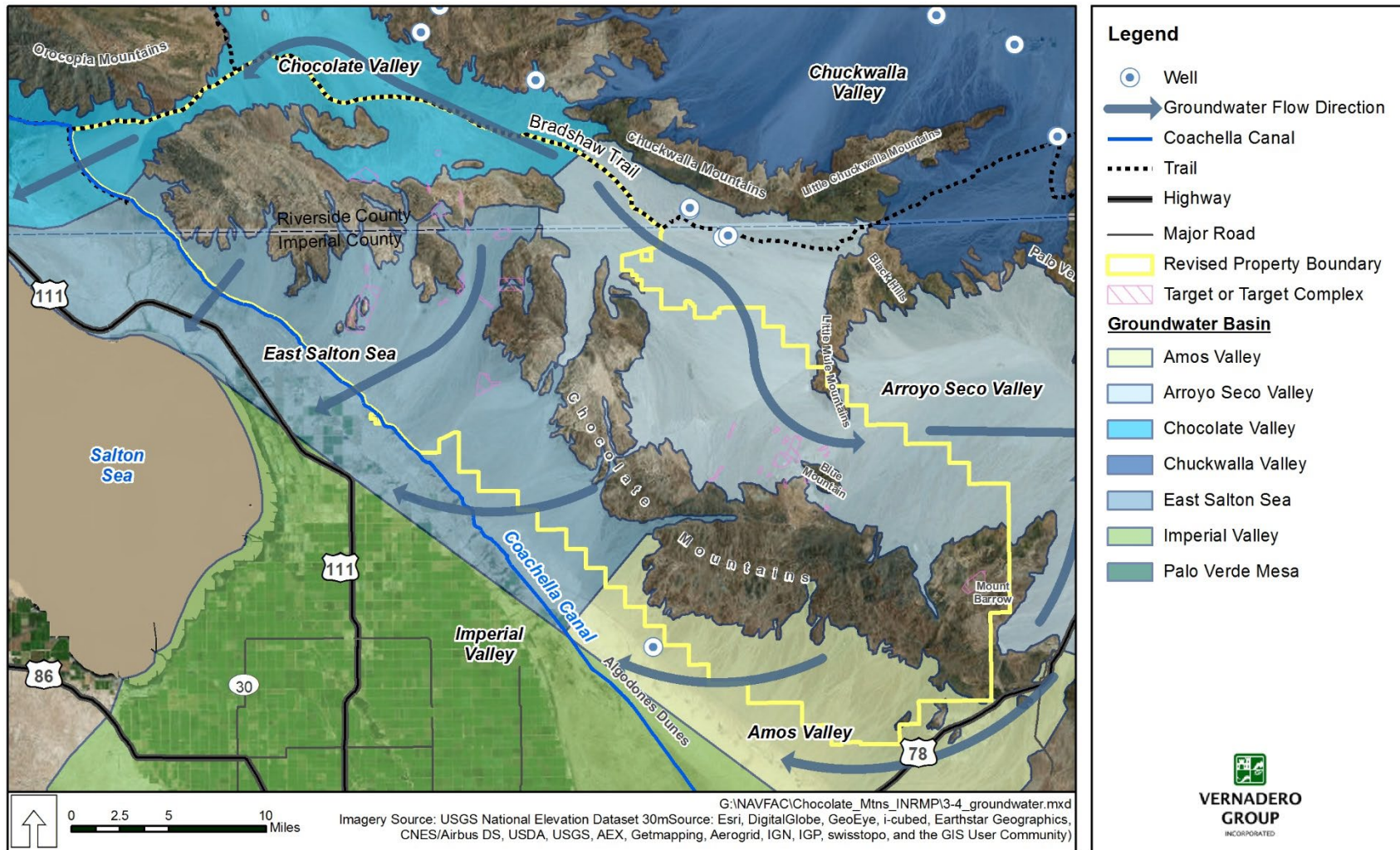


Figure 3-4. Groundwater of the CMAGR

3.2 Air Quality

Air quality is defined by ambient air concentrations of specific pollutants that have been determined by the U.S. Environmental Protection Agency (EPA) to be of concern with respect to the health and welfare of the general public. This resource type considers ambient (outdoor) air quality and emissions of air pollutants regulated by the Clean Air Act of 1963, as well as the greenhouse gases: water vapor, carbon dioxide (CO₂), tropospheric ozone, nitrous oxide (N₂O), and methane (CH₄). Seven major pollutants of concern, called “criteria pollutants,” are carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), suspended particulate matter less than or equal to 10 microns in diameter (PM₁₀), fine particulate matter less than or equal to 2.5 microns in diameter (PM_{2.5}), and lead (Pb). The EPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. Areas that violate a federal air quality standard are designated as nonattainment areas.

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The ambient air quality levels measured at a particular location are determined by the interactions of emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter of air) or as a volume fraction (e.g., parts per million by volume).

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO₂, Pb, and some particulates, are emitted directly into the atmosphere.

Secondary pollutants, such as O₃, NO₂, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM₁₀ and PM_{2.5} are generated as primary pollutants by various mechanical processes (e.g., abrasion, erosion, mixing, or atomization) or combustion processes; however, PM₁₀ and PM_{2.5} also can be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols. In general, emissions that are considered “precursors” to secondary pollutants are those evaluated to control O₃ levels in the ambient air, such as reactive organic gases and oxides of nitrogen (NO_x).

Air quality at a given location can be described by the concentrations of pollutants in the atmosphere. Pollutants are defined as having two general types: 1) criteria pollutants and 2) toxic compounds. Criteria pollutants have national and/or state ambient air quality standards. The EPA establishes the NAAQS, while the California Air Resources Board establishes the state standards, termed the California Ambient Air Quality Standards (CAAQS). The NAAQS

represent maximum acceptable concentrations that generally may not be exceeded more than once per year, except for annual standards, which may never be exceeded. The CAAQS represent maximum acceptable pollutant concentrations that are not to be equaled or exceeded. Areas that do not meet the air quality standard are designated as “nonattainment” areas.

A portion of the CMAGR lies within Imperial County and a portion lies within Riverside County. Both counties are considered to be nonattainment areas for respirable particulate matter (PM₁₀), NO_x, and O₃ precursors (EPA 2015). The *de minimis* thresholds for the Imperial County portion of the CMAGR are 100 tons per year for O₃ precursors, including NO_x and reactive organic gases, and 70 tons per year for PM₁₀. The thresholds for the Riverside County portion of the CMAGR are 25 tons per year for O₃ precursors and 70 tons per year for PM₁₀. The California Air Resources Board is responsible for enforcing both the federal and state air pollution standards (EPA 2015).

Currently, the EPA is reconsidering the 2020 decision to retain the 2015 O₃ standards; the agency is attempting to complete the reconsideration by the end of 2023. Reasons for the reconsideration are that the EPA received many legal challenges following the retention of the 2015 O₃ standards and that the 2020 review did not include an O₃-specific panel that supports the Clean Air Scientific Advisory Committee. In part, there was a conflict with O₃ levels. Seemingly overall, the O₃ levels have dropped over 20 percent in the last 20 years; however, there were approximately 100 counties that documented O₃ levels above the 2015 standards (EPA 2021).

3.3 Biotic Environment

Biotic environment in this INRMP refers to the vegetation, general wildlife, special status species and invasive species of the CMAGR.

3.3.1 Vegetation

A complete study of the vegetation and flora of CMAGR will be completed by the end of 2022 (Malusa and Sanders, in progress). Until the final report is released, the only available data for vegetation on the CMAGR is from the Vegetation Classification and Mapping Program (VegCAMP) land cover data (VegCAMP et al. 2013).

The VegCAMP program focuses on developing and maintaining maps and the classification of all vegetation and habitats in the state to support conservation and management decisions at the local, regional, and state levels. The VegCAMP map of the CMAGR is derived from remotely sensed data, with few field observations because of access restrictions. As the ongoing study of Malusa and Sanders has revealed, the VegCAMP map errs in (1) classifying vast bajadas (alluvial fans) as “Wash/Woodland” when they lack species characteristic of washes; (2) mapping a “Shadscale-Saltbush” ecosystem that holds neither species; (3) classifying the vast majority of the mountains simply as “Bedrock Cliff and Outcrop,” which indicates little or no vegetation in areas that in fact hold several vegetated ecosystems; and (4) failing to recognize and map large areas of desert pavements.

Following the protocols of CDFW VegCAMP, Malusa and Sanders surveyed 303 "Rapid Assessment Plots" throughout the CMAGR (Figure 3-5). The following is an alphabetical list of the vegetation units mapped and described by Malusa and Sanders (at the association and alliance levels, which are more detailed than ecosystems).

Ambrosia dumosa Alliance
Ambrosia salsola - *Bebbia juncea* Alliance
Atriplex canescens Alliance
Atriplex hymenelytra Alliance
Chorizanthe rigida - *Geraea canescens* Alliance
Cylindropuntia bigelovii Alliance
Encelia farinosa - *Psoralea schottii* Association
Encelia farinosa Alliance
Ephedra nevadensis - *Lycium andersonii* - *Grayia spinosa* Alliance
 Human disturbance
Hyptis emoryi - *Nolina bigelovii* Association
Larrea tridentata - *Ambrosia dumosa* - *Calliandra eriophylla* Association
Larrea tridentata - *Ambrosia dumosa* - *Fouquieria splendens* Association
Larrea tridentata - *Ambrosia dumosa* - *Psoralea schottii* Association
Larrea tridentata - *Ambrosia dumosa* - *Yucca schidigera* Association
Larrea tridentata - *Ambrosia dumosa* / *Cylindropuntia munzii* Association
Larrea tridentata - *Ambrosia dumosa* / *Olneya tesota* Association
Larrea tridentata - *Ambrosia dumosa* Association
Larrea tridentata - *Encelia farinosa* Alliance
Larrea tridentata Association
 Major canals
Mud Hills sparsely vegetated ephemeral herbs Mapping Unit
North American warm desert bedrock cliff and outcrop Group
Parkinsonia florida - *Olneya tesota* / *Cylindropuntia munzii* Association
Parkinsonia florida - *Olneya tesota* / *Hyptis emoryi* Association
Parkinsonia florida - *Olneya tesota* Alliance
Parkinsonia florida - *Olneya tesota* Association
Parkinsonia florida Association
Pleuraphis rigida Floodplain Association
Prosopis glandulosa Association
Psoralea spinosus - *Chilopsis linearis* Association
Psoralea spinosus / *Ambrosia salsola* - (*Bebbia juncea* - *Ephedra californica*) Association
Salvia greatae Association
Senegalia greggii - *Hyptis emoryi* - *Justicia californica* Alliance
Tamarix spp. Alliance
 Urban

3.3.2 *General Flora and Fauna*

General flora and fauna are considered to be all species observed on CMAGR that are not considered to be special status species (Sections 3.3.3 and 3.3.4) or rare plants. A table showing the variety of general flora and fauna species that have been documented on the CMAGR is provided as Table A-1 in Appendix A. The species listed in this table have been officially documented with a published reference; by no means is this list a comprehensive list of all species found on CMAGR. Secretive and/or smaller taxa, particularly small mammals and reptiles, may be underrepresented on this list.

3.3.3 *Special Status Species*

Special status species include federally threatened or endangered species protected by the ESA, as well as species protected by the California ESA. This definition also includes species that are considered species of special concern by either the USFWS or CDFW, are considered rare plants by the California Native Plant Society (CNPS) and are given a California Rare Plant Rank (CRPR), or are considered BLM special status species. No rangewide surveys for special status species have been conducted. Special status species reported have been historically observed during focused surveys (e.g., the desert tortoise) or by incidental observations, such as observations of the Cooper's hawk (*Accipiter cooperii*) made by Circle Mountain Biological Consultants, Inc. (CMBC) 2013 and golden eagle (*Aquila chrysaetos*) recorded by Gulf South Research Corporation (GSRC) personnel on 25 February 2020 (GSRC 2021). Figure 3-6 shows recorded locations for special status species on and in the vicinity of the CMAGR. Special status species discussed in this section have all been recorded on the range.



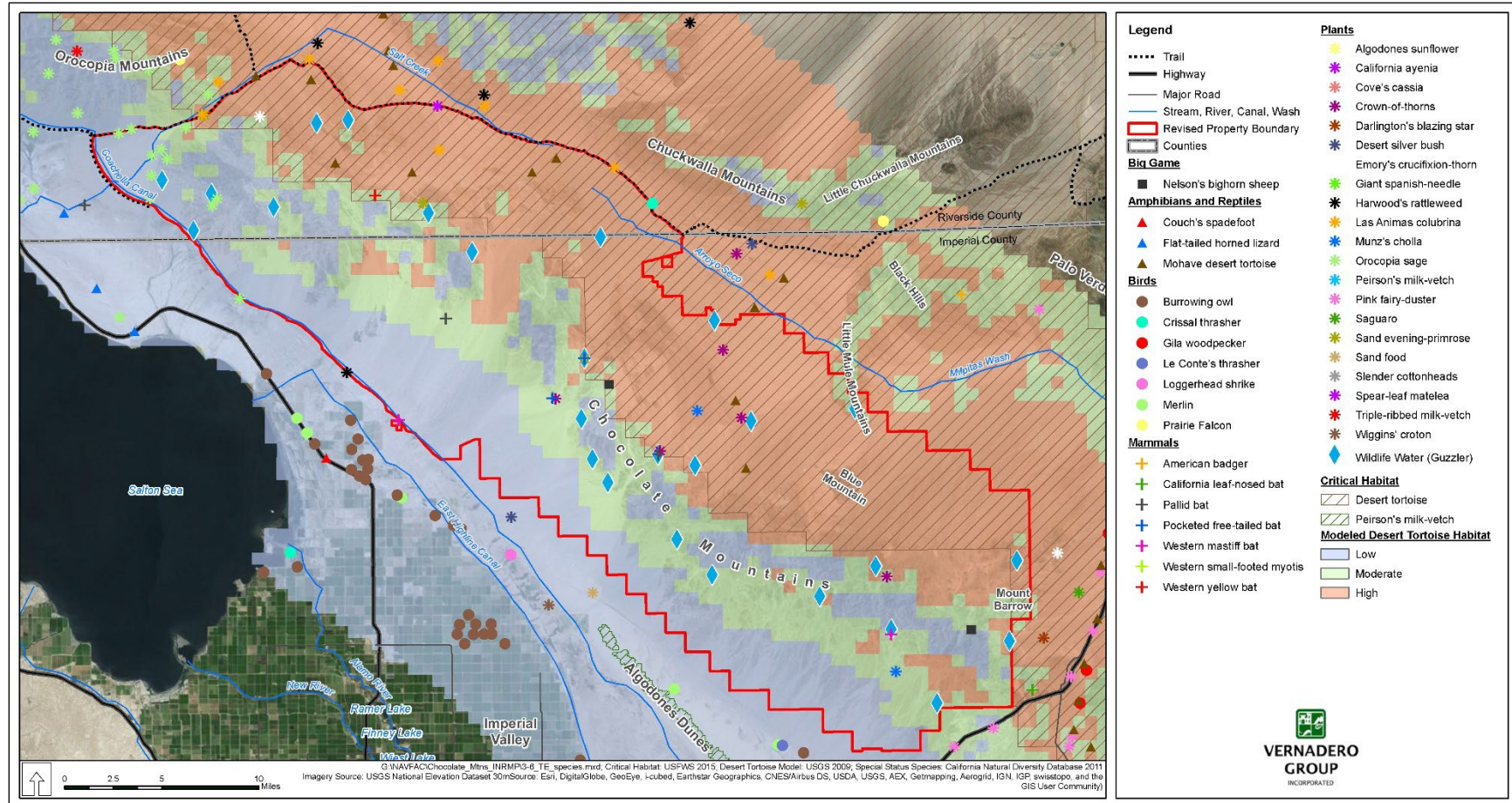


Figure 3-6. Special Status Species Recorded within the Vicinity of the CMAGR

Agassiz Desert Tortoise (*Gopherus agassizii*)

On 4 August 1989, the USFWS published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 *Federal Register* [FR] 42270). On 2 April 1990, the USFWS determined the Mojave population of the desert tortoise (Figure 3-7) to be threatened (55 FR 12178). Reasons for the determination included significant population declines; loss of habitat from construction projects (e.g., roads, housing and energy developments); conversion of native habitat to agriculture; livestock grazing and OHV activity; illegal collection by humans for pets or consumption; upper respiratory tract disease; predation on juvenile desert tortoises by common ravens (*Corvus corax*), coyotes (*Canis latrans*), and kit foxes (*Vulpes macrotis*); fire; and collisions with vehicles on paved and unpaved roads.

The Mojave Desert population of the Agassiz desert tortoise primarily occurs in the bajadas, mountain foothills, and valleys of the Mojave and Colorado deserts west of the Colorado River. This species usually occurs below 4,000 feet in creosote bush and saltbush scrub habitats, tree yucca (Joshua tree and Mojave yucca) communities, and some ocotillo-creosote habitats (Stebbins 2003, Brennan and Holycross 2006). Creosote bush, white bursage, tree yucca, galleta grass (*Hilaria rigida*), and blackbrush (*Coleogyne ramosissima*) are indicator species of overall desert tortoise habitat (Brennan and Holycross 2006, Nussear et al. 2009). Indicator species are a species or group of species that reflect the state of an environment or indicate the diversity of other species within an area. The desert tortoise occupies a wide variety of soil types and substrates that include sand dunes, rocky hillsides, and caliche caves in washes, sandy soils, and desert pavements. Tortoises must have suitable substrates and terrain for digging burrows (Stebbins 2003, Brennan and Holycross 2006). The availability of adequate forage resources consisting of native grasses, herbaceous perennials and annuals, and cacti are important for determining desert tortoise habitat suitability (Stebbins 2003, Brennan and Holycross 2006, Nussear et al. 2009).

On 8 February 1994, the USFWS designated approximately 6.44 million acres of critical habitat for the Mojave population of the desert tortoise in portions of California (4,750,000 acres), Nevada (1,220,000 acres), Arizona (339,000 acres), and Utah (129,000 acres) (59 FR 5820-5846, also see corrections in 59 FR 9032-9036). These designations became effective on 10 March 1994. A desert tortoise Recovery Plan was published in June 1994 (USFWS 1994a). The Recovery Plan is the basis and key strategy for recovery and delisting. The Recovery Plan identified six recovery units and recommended the establishment of 14 Desert Wildlife Management Areas (DWMAs) within the recovery units. DWMA surveys began in 1996. The 1994 Recovery Plan for the desert tortoise was recently updated in 2011 (USFWS 2011).

Regional pressures on desert tortoises and their habitats include illegal collection, trash dumping, increased raven populations, domestic predators, OHV use, exposure to disease, mortality (USFWS 1994a, Krzysik 1998, Boarman 2002), and large-scale and dispersed renewable energy development. The value that military lands can provide for conservation has long been recognized (Stein et al. 2008). Restricted-access military lands provide an extensive network of tortoise habitats that are managed either directly or indirectly for desert tortoise conservation. Military lands with conservation objectives expressed through compliance with

Sikes Act include a great deal of desert tortoise habitat outside of and contiguous with designated tortoise conservation areas (USFWS 2011). Desert tortoise surveys conducted on the CMAGR yield some of the highest densities of desert tortoise in any of the recovery units (USFWS 2020a).

The USFWS programmatic BO (BO 1-6-95-F-40) addressed the existing and proposed military use activities for the Yuma Training Range Complex EIS (1994). The USFWS's opinion was that the CMAGR activities would not jeopardize the desert tortoise or result in significant destruction or adverse modification of its critical habitat (USFWS 1996). The USFWS based its opinion on the percentage of the CMAGR critical habitat affected by training and conservation measures enacted by MCAS Yuma.



Figure 3-7. Agassiz Desert Tortoise (*Gopherus agassizii*)

Conservation measures executed by MCAS Yuma to reduce potential impacts to the species are based upon the 1996 BO. In addition, there were three BOs provided by the USFWS as amendments to the 1996 BO: Proposed Target Complex Invader (USFWS 2015b), Proposed SWATs 4 and 5 (USFWS 2015c), and Proposed MV-22 Landing Zones, Assault Landing Zones, and Artillery Firing Areas – Amendment to Biological Opinion 1-6-95-F-40 for Military Use of the

Chocolate Mountain Aerial Gunnery Range, Imperial and Riverside Counties, California (USFWS 2015d). All three BOs are incorporated into this INRMP as follows:

1. MCAS Yuma will designate a Tortoise Management Representative (TMR) within the Range Management Department whose duty will be to ensure compliance with protective stipulations by all range users. This TMR will have the authority to halt activities that may be in violation of such provisions. The TMR also will coordinate with the designated USFWS representative on all matters concerning desert tortoise handling (if necessary)¹, mitigation, and management responsibilities.
2. All ground users accessing the CMAGR will participate in the MCAS Yuma tortoise education program, which has been developed cooperatively with the USFWS and will be updated as new data are obtained. The program will include, at a minimum, the following topics: 1) occurrence of desert tortoises, 2) sensitivity of the species to human activities, 3) legal protection for desert tortoises, 4) penalties for violations of federal laws, 5) general tortoise activity patterns, 6) reporting requirements, 7) measures to protect tortoises, 8) personal measures that users can take to promote desert tortoise conservation, and 9) procedures and a point of contact if a desert tortoise is observed on site.
3. All ground users of the range will be informed of their responsibilities to avoid injury and/or harm to desert tortoises and to report any form of take to the TMR.
4. Explosives Ordnance Disposal (EOD) personnel will monitor any takings as part of target area sweeps. EOD personnel will report to the TMR any injured or dead tortoises located during EOD sweeps, as well as habitat damage outside of designated target areas. Each EOD crew will fill out a form after each sweep, reporting any take. The TMR or qualified appointee(s) will be available or on call to respond to any tortoise incidents.
5. All roads entering and within designated desert tortoise critical habitat will have signs posted with speed limits of 20 miles per hour. To the extent practicable, vehicles will remain on established roads except as required for specific training activities. To reduce potential impacts, vehicles used during specified training activities will stay within the confines of road boundaries until the destination is reached.
6. All personnel operating vehicles within desert tortoise habitat on the range will inspect underneath their parked vehicle, prior to moving it. If a desert tortoise is observed

¹ Tortoise Handling Procedures:

1. Only biologists authorized by the USFWS shall handle desert tortoises, except in circumstances in which the life of the desert tortoise is in immediate danger. For biologists not already authorized, the MCAS Yuma shall submit their credentials to the USFWS for review and approval at least 30 days before the initiation of any activity within desert tortoise habitat.
2. Desert tortoises shall be moved only by an authorized biologist and solely for the purpose of moving the animals out of harm's way. Desert tortoises shall be moved the minimum distance to ensure their safety.
3. All handling of tortoises and their eggs and excavation of burrows are to be conducted by an authorized biologist in accordance with up-to-date protocols accessed at the USFWS website (<https://www.fws.gov/program/desert-tortoise-recovery>).
4. If an emergency situation exists and a tortoise must be moved out of immediate danger, the animal may be moved to an adjacent shaded area (normally plant cover) out of direct sunlight. Desert tortoises shall only be moved the minimum distance to ensure their safety. Range Management shall be notified.

beneath the vehicle, the tortoise will be allowed to move away on its own or the TMR or qualified appointee(s) will be contacted to move the animal out of harm's way.

7. No pets will be permitted at any time within desert tortoise habitat. Military working dogs will be permitted under control of their handler.
8. All ground personnel that enter the range will be required to remove all food stuffs, trash or other waste that may attract ravens, coyotes, or other desert tortoise predators. Any trash receptacles used for extended stays will be equipped with latching/locking lids. Waste management will be guided by the Range and Training Areas Standard Operating Procedures under Chapter 2, "Environmental Procedures."

Raven Measures:

- Any raven or raven nests discovered (including, on transmission infrastructure) will be evaluated by MCAS Yuma biologists for desert tortoise predation. If any evidence of predation is observed, the surrounding area will be searched for raven and raven nests. Any predatory ravens and their nests will be removed using methods identified in the USMC's environmental assessment (USMC 2022).
- Wildlife guzzlers will be monitored periodically by biologists, range inspectors, and range wardens for water availability and raven usage. Observations of desert tortoise carcasses and raven nests near guzzlers will prompt further evaluation.
- Construction personnel, range wardens, range inspectors, and troops using the training areas will be educated and instructed to report any raven sightings, which will be investigated and documented by a MCAS Yuma biologist.
- Public use is restricted and will continue to be restricted within the CMAGR, thus reducing the attraction of ravens.
- Range signs and fencing will be minimized to reduce perching.
- Abandoned vehicles found on the CMAGR will be inventoried and removed as appropriate.
- Also, CMAGR has proposed to implement integrated, adaptive raven management to resolve ecological, economic, and health and safety impacts of the elevated and increasing raven populations in the California desert as part of a consolidated management effort by six DoD installations (USMC 2022).

9. New Construction and/or Ground-Disturbing Activities:

- Preproject clearance surveys conforming to the USFWS recommendations will be followed for new construction or other ground disturbing activity (i.e., new target site designation). Clearance surveys will be conducted by the TMR or other qualified tortoise biologist.
- A qualified desert tortoise biologist will be "on-call" and available during any new construction and/or ground-disturbing activities to address the situation if a desert tortoise must be moved out of harm's way.

- New construction boundaries and/or other ground-disturbing activities will be determined in the field, mapped, and marked with monuments or flagging prior to the onset of any disturbance. New construction or other ground-disturbing activity will be placed outside and away from surface drainages, when feasible.
 - Any excavations associated with construction and maintenance that will be left open in areas that are not being monitored will either be fenced temporarily to exclude desert tortoises, covered at the close of each work day, or provided with ramps so desert tortoises can escape. All excavations will be inspected for desert tortoises before filling.
 - Desert tortoise exclusion fencing will be installed, when feasible, around each new construction site prior to construction. The TMR or qualified desert tortoise monitor will be present during the initial activity at each construction site. Once the desert tortoise fence is installed around each construction site and the clearance surveys are completed, the monitor would no longer need to be present. If a desert tortoise is located in the project area during construction activities, it will be allowed to move away on its own or safely moved by a qualified desert tortoise biologist. The desert tortoise fences will be removed upon completion of construction activities.
 - A Field Contact Representative (FCR) will be designated once ground clearing is completed and the desert tortoise fences are installed. The FCR will be responsible for overseeing compliance with biological resources conservation measures and any other required terms and conditions resulting from consultation between MCAS Yuma and USFWS. The FCR will be on the site during all construction activities and have a copy of all avoidance and minimization measures available at all times. The FCR may be a crew chief, field supervisor, project manager, or a contracted biologist. The FCR will have the authority to halt construction, operation, or maintenance activities that are in violation of these requirements. A representative from the MCAS Yuma Range Management Department will make biweekly visits to ensure compliance.
14. The TMR or appointee(s), will survey all ground support areas for dead or injured tortoises after the completion of each ground operation.
15. The TMR will notify the USFWS within three working days of the discovery of any desert tortoise death or injury caused by military activity. Notification will include the date, time, circumstances, and location. Dead tortoises will be left in situ. Injured tortoises will be taken to an approved USFWS veterinarian. This information will also be included in the USFWS's annual report.
16. An annual monitoring report will be prepared and delivered to the USFWS on or before January 15 of each year. The report will briefly outline the effectiveness of the desert tortoise conservation and/or mitigation measures and summarize the mortality or injury to desert tortoises. The report will make recommendations for modifying or refining the terms and conditions to enhance desert tortoise protection.

17. Depending on available funding, line distance sampling surveys will be completed annually under the direction of the USFWS (Desert Tortoise Recovery Team) and implement current USFWS methods. The desert tortoise surveys will take place during regularly scheduled spring range closures. These surveys will be used to define tortoise densities within the critical habitat and monitor population trends within the range. Surveys will be conducted annually until the desert tortoise's Mojave population, or the East Colorado Recovery Unit, is removed from the list of threatened and endangered species. All survey data will be entered into the MCAS Yuma GIS desert tortoise database.
18. This INRMP will serve as the Desert Tortoise Management Plan, which was originally identified in the programmatic BO as a conservation measure. The conservation measures and metrics to monitor the plan's effectiveness are identified herein and will supersede the need to develop a separate plan. The plan objectives are as follows and will be incorporated into this revised and future INRMPs:
- Identify ways to minimize impacts on desert tortoises from ongoing activities within the range.
 - Manage the species and designated critical habitat in a manner consistent with the most up-to-date Desert Tortoise Recovery Plan (USFWS 2011).

The CMAGR is the primary military installation harboring desert tortoise habitat in California's Colorado Desert (USFWS 1990, 1994a) which consists of approximately 187,842 acres of critical habitat. The critical habitat designation and publication of the first recovery plan (USFWS 1994a) established the Chuckwalla DWMA (and others) based on the presence of critical and large contiguous areas of desert tortoise habitat. Approximately 40 percent of the range occurs within designated desert tortoise critical habitat—that is, most of the range east of the Chocolate Mountains (USFWS 1994b). Approximately 2,915.05 acres (1.5 percent) of military training sites are within the designated critical habitat boundaries and exempted from critical habitat due to their lack of constituent elements and previous military training activities (USFWS 1994a). Surveys for desert tortoise have been conducted at CMAGR since 1998, and population trends are summarized in Table 3-2.

Table 3-2. Desert Tortoise Trends at CMAGR

Desert Tortoise Survey Year	Live Tortoises	Tortoise Carcasses	Tortoise Density (tortoises per square kilometer)	Number of Transects
1998	12	0	Not calculated	7
1999	31	0	Not calculated	41
2000	40	0	Not calculated	41
2001	55	0	Not calculated	106
2002	31	0	Not calculated	45
2003	31	0	Not calculated	47
2004	68	0	Not calculated	43

Desert Tortoise Survey Year	Live Tortoises	Tortoise Carcasses	Tortoise Density (tortoises per square kilometer)	Number of Transects
2005	30	0	Not calculated	21

Table 3-2. Desert Tortoise Trends at CMAGR (cont'd)

Desert Tortoise Survey Year	Live Tortoises	Tortoise Carcasses	Tortoise Density (tortoises per square kilometer)	Number of Transects
2006	No surveys	No surveys	No surveys	No surveys
2007	27	0	7.1	35
2008	6	0	3.4	14
2009	16	0	7.3	33
2010	50	0	13.8	33
2011	No surveys	No surveys	No surveys	No surveys
2012	21	0	6.1	33
2013	36	0	7.3	35
2014	33	0	8.4	48
2015	39	0	10.3	36
2016	60	0	8.5	36
2017	58	0	9.4	36
2018	29	13	7.6	30
2019	58	16	North 14.2/South 3.0	37
2020	61	13	North 12.9/South 3.5	29
2021	29	15	North 7.2/South 2.2	35
2022	26	21	No densities	Not available

For areas that experience ground-based training pressure (Table 3-3), the activities range from ordnance impacts in target areas to vehicular and foot traffic on designated roads and in authorized areas used for drop zones and ground support. Desert tortoise occurrences are reported from the northeastern side of the Chocolate Mountains and southward along State Route 78 (California Department of Fish and Game [CDFG] 2011). Suitable habitat occurs for the species throughout the CMAGR, but density estimates are low for the west side of the Chocolate Mountains (Dames and Moore 1995, Nussear et al. 2009, CMBC 2013). In addition, during herpetological surveys, a desert tortoise was observed adjacent to the drift fence at Array 9 (GSRC 2021).

Primary constituent elements of desert tortoise critical habitat include:

- Sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow

- Sufficient quality and quantity of forage species and the proper soil conditions to provide for the species growth
- Suitable substrates for burrowing, nesting, and overwintering
- The presence of burrows, caliche caves, or other shelter sites
- Sufficient vegetation to provide shelter from temperature extremes and predators
- Habitat protected from disturbance and human-caused mortality

Table 3-3. Military Surface Use in CMAGR Critical Habitat

Military Surface Use	Total Acres Intersecting Desert Tortoise Critical Habitat
Core Weapons Impact Area*	1,896.77
Military Support Areas	745.69
Roads	270.62
Railroads	1.97

* Activity results in ground-based training pressure.

Nelson's Desert Bighorn Sheep (*Ovis canadensis nelsoni*)

Nelson's desert bighorn sheep (desert bighorn) (Figure 3-8) is considered a sensitive species by the BLM but not otherwise designated by the USFWS. Nelson's desert bighorn sheep is also a California fully protected species with the exception of legal hunting in compliance with 14 California Code of Regulations 362. These desert bighorn sheep are found in the desert mountains of southeastern California and favor open, rocky, and steep terrain and avoid dense vegetation that blocks visibility (CDFG 2011). Habitat used by desert bighorn also includes springs and plateaus (BLM 2002a). The CMAGR subpopulation is part of a larger Sonoran metapopulation.



Figure 3-8. Nelson's Desert Bighorn Sheep (*Ovis canadensis nelsoni*)

Long-term survival of local subpopulations of bighorn sheep requires movement of individuals among regional subpopulations to prevent genetic bottlenecks, maintain viable population numbers, and recolonize vacant or formerly occupied areas (Schwartz et al. 1986, Bleich et al. 1990, BLM 2002a). Desert bighorn sheep move from mountains through valleys to reach preferred habitat sites (Bleich et al. 1990, BLM 2002a). The Coachella Canal, Interstate 10, and State Route 78 are filter-barriers that inhibit or prevent the historical movement of bighorn sheep between regional mountain ranges (BLM 2002a). Historical movement corridors from the Chocolate Mountains to the Orocopia Mountains, Chuckwalla Mountains, and Palo Verde Mountains likely remain intact because there is little to no developed land between these mountain ranges.

CDFW offers limited hunting of this subspecies; the agency allowed 12 tags in 2015 (CDFW 2015). Desert bighorn on the CMAGR cannot be hunted because of the safety hazards associated with military training that necessarily keeps the area closed to public use.

American Badger (*Taxidea taxus*)

The American badger (Figure 3-9) is designated as a California species of special concern but has no federal special status. The presence or absence of the American badger on the CMAGR is not well understood, and there are very few entries for the species in the California Natural Diversity Database. Although no incidental observations of badgers were made during a

focused desert tortoise survey and habitat assessment in SWATs 4 and 5 in 2012, badgers were detected by diagnostic digs along 52 of 179 (29 percent) of all desert tortoise transects conducted by CMBC (2013). During focused small-mammal surveys, the American badger was visually observed (GSRC 2021); however, it is not unusual to detect American badger and not see the animals. For example, during spring and summer 2011 surveys of the Marine Corps Air Ground Combat Center in Twentynine Palms, California, CMBC biologists detected 990 badger digs (and several diagnostic scat) while seeing only one animal (LaRue 2012).



Figure 3-9. American Badger (*Taxidea taxus*)

Couch's Spadefoot (*Scaphiopus couchii*)

Couch's spadefoot (Figure 3-10) is a California species of special concern and is considered a sensitive species by the BLM. It has no other federal special status species designation. Couch's spadefoot inhabits desert and arid regions of grassland, prairie, mesquite, creosote bush, thorn forest, and sandy washes. In California, it is present in these habitats in the Colorado and Sonoran deserts. Its occurrence in Imperial County is probably not fully documented, although well-known and well-documented habitat exists along the UPRR right-of-way on the CMAGR's southern border. Couch's spadefoot may spend most of the year buried underground, emerging only to feed and breed after monsoonal rains have created temporary ponds used for breeding. Larvae are capable of maturing and leaving the ponds within eight days. Since the breeding ponds are ephemeral, and larvae are only present for a short time, Couch's spadefoot is not easily detected unless targeted surveys are conducted.



Figure 3-10. Couch's Spadefoot (*Scaphiopus couchii*)

Golden Eagle (*Aquila chrysaetos*)

The golden eagle (Figure 3-11) is on the CDFW watch list and is federally protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). It is also considered a sensitive species by the BLM and is a USFWS bird of conservation concern. Golden eagles are upper-trophic aerial predators that forage on small to mid-sized reptiles, birds, and mammals up to the size of mule deer fawns and coyote pups (Bloom and Hawks 1982). They also are known to scavenge and utilize carrion (Kochert et al. 2002). Golden eagles inhabit a variety of habitats, including forests, canyons, shrublands, grasslands, oak woodlands, and deserts. Golden eagles have been observed soaring at CMAGR.



Figure 3-11. Golden Eagle (*Aquila chrysaetos*)

Cooper's Hawk (*Accipiter cooperii*)

Cooper's hawk (Figure 3-12) is on the CDFW watch list and is federally protected under MBTA. One was observed by CMBC in SWAT 4 flying through a microphyllous woodland on the afternoon of 28 April 2012. This medium-sized raptor can be both resident and migratory, preying upon small passerines. Cooper's hawks are more likely to nest in larger landscaped trees, such as various palm species in the region, than in the smaller ironwoods and palo verdes on the CMAGR. They are likely to forage throughout the CMAGR, particularly in microphyllous woodlands, where they may seek both cover and prey species, but are not likely to nest (CMBC 2013).



Figure 3-12. Cooper's Hawk (*Accipiter cooperii*)

Vaux's Swift (*Chaetura vauxi*)

Vaux's swift (Figure 3-13) is designated as a California species of special concern and is federally protected under the MBTA. This species is also a USFWS bird of conservation concern. Individual birds and one small flock of three were observed on three occasions on the CMAGR, twice on 13 April 2012 and once on 4 May 2012 (CMBC 2013). This migratory species is considered to be incidental to the CMAGR, foraging over the area as it passes through, but is not expected to nest.



Figure 3-13. Vaux's Swift (*Chaetura vauxi*)

Swainson's Hawk (*Buteo swainsoni*)

Swainson's hawk (Figure 3-15) is designated as a California threatened species and as a bird of conservation concern by USFWS. It is also federally protected under MBTA and considered a sensitive species by the BLM. Swainson's hawks were observed by CMBC on two occasions over SWAT 4: once on 8 April 2012, and a second time on 13 April 2012 (CMBC 2013). As a migrant, Swainson's hawks likely occur throughout the CMAGR during spring and fall migration periods when they may forage but do not nest. The migration pathway of the Swainson's hawks is not well characterized in this region. As of yet, no migratory roosting sites on the CMAGR have been discovered.



Figure 3-14. Swainson's Hawk (*Buteo swainsoni*)

Loggerhead Shrike (*Lanius ludovicianus*)

The loggerhead shrike (Figure 3-15) is designated a California species of concern, is a bird of conservation concern by the USFWS, and is federally protected under MBTA. The loggerhead shrike is a commonly encountered bird species on the CMAGR, having been detected in 24 different locations by CMBC in April 2012 (CMBC 2013). They are likely to nest in microphyllous woodland and forage throughout SWATs 4 and 5 (CMBC 2013).



Figure 3-15. Loggerhead Shrike (*Lanius ludovicianus*)

Burrowing Owl (*Athene cunicularia*)

The burrowing owl (Figure 3-16) is designated as a California species of special concern and as a USFWS bird of conservation concern, and it is federally protected under MBTA. This species is also considered sensitive by the BLM. Burrowing owls were detected in 14 different locations on the CMAGR in 2012 (CMBC 2013). Diagnostic signs of this special status bird species included whitewash (feces), feathers, regurgitated pellets, and zygodactyl (x-shaped) tracks at suitable burrows and cover sites in CMBC's April 2012 field surveys (CMBC 2013). Although three signs of burrowing owl were observed on the CMAGR, they were most often encountered and detected at caliche caves in the northeastern portions of SWAT 5. In addition, a burrowing owl was incidentally observed on Ted Kipf Road, near Salvation Pass, during a nocturnal survey (GSRC 2021).



Figure 3-16. Burrowing Owl (*Athene cunicularia*)

Orocopia Sage (*Salvia greatae*)

Designated by CRPR as a List 1B.3 and a BLM sensitive species, Orocopia sage (Figure 3-17) is considered to be rare, threatened, or endangered in California and elsewhere, but not very threatened in California (low degree/immediacy of threats or no threats known). This plant is endemic to the Salt Creek area, Orocopia Mountains, and northern Chocolate Mountains of southern California, and is considered a sensitive species by the BLM. It was observed in 2008 along 23 different survey transects on the northern portions of SWAT 4 (one transect) and western portions of SWAT 5 (22 transects) (Woodman 2008). In 2012, this medium-sized shrub was observed along two transects in SWAT 4 and five transects in SWAT 5. The surveys of Malusa and Sanders (in progress) found this species to be locally common. Previously, the species was only known on the slopes leading down to Salt Creek at the extreme northern end

of the range at elevations from 30 to 100 meters (100 to 1,000 feet), but Malusa and Sanders observed it in mountain canyons on deeply cut alluvium and colluvium fringing arroyos as high as 620 meters (2,030 feet).



Figure 3-17. Orocopia Sage (*Salvia greatae*)

Sand Evening Primrose (*Chylismia arenaria*) = Fortuna Range Suncup (*Chylismia arenaria*)

The CNPS considers the sand evening primrose (now known as the Fortuna Range suncup; see Figure 3-18) to be a List 2.2 species, meaning it is rare, threatened, or endangered in California but more common elsewhere and, specifically, fairly threatened in California (moderate degree/immediacy of threat). It was observed in 2012 at one location in SWAT 4 and one location in SWAT 5. According to Malusa and Sanders (in progress), it is also found along the Gas Line Road and several locations westward. This species is present in the Colorado River Valley in California and Arizona from Yuma to Topock and eastward into western Arizona near Highway 93 south of Wikiup and north to the Black Mountains near Oatman. A major

population center is the range of dry rocky hills running from Yuma, southeast to the international boundary near Cerro Pinto, including the Fortuna Hills from which this plants' common name is derived. In California this species is restricted to the southeastern corner of the state in Imperial County and adjacent Riverside County in the Chocolate, Chuckwalla, Palo Verde, and Orocopia mountains. It is a very scarce and localized perennial on the CMAGR, primarily an inhabitant of rocky crests and steep mountain sides, but also found along washes, where it is perhaps a waif. The largest populations Malusa and Sanders found were in steep places that the numerous burro mule deer (*Odocoileus hemionus eremicus*) of the alluvial slopes cannot easily reach.



Figure 3-18. Fortuna Range Suncup (*Chylismia arenaria*)

3.3.4 Other Special Status Species

Certain other special status species are not known to occur on the CMAGR, are occasional visitors such as migratory birds or bats, or if they are present, they are unlikely to be affected by CMAGR activities; these species are summarized in Table B-1 in Appendix B.

3.4 Invasive Species

Executive Order 13112 requires federal agencies to (1) identify actions that may affect invasive species, (2) use relevant programs to prevent introduction of invasive species, (3) detect, respond, and control such species, (4) monitor invasive species populations, (5) provide for

restoration of native species, (6) conduct research on invasive species, and (7) promote public education (Executive Order 13112, 1999).

Human-induced and natural biological invasions into new regions, whether accidental or deliberate, persist both locally and globally, for both plants and animals (Fronhofer and Altermatt 2015, Li et al. 2015, Zeitz et al. 2016). Once established, nonnative-species often lead to changes in ecosystem processes (such as fire frequency, size, and intensity, or altered nutrient levels) that are self-maintaining and evolving, leading to functional as well as compositional ecosystem change (Brooks et al. 2004, Adair and Burke 2010). In addition to competing with and displacing native species, these introduced species can hybridize with native species and alter conditions to promote the establishment and spread of other nonnative species. They also bring their respective pathogens and parasites (Warburton et al. 2002, Kuperman et al. 2004).

In the case of plants, several studies have pointed to various environmental and climatic variables as potential drivers for sustaining or increasing nonnative plant dominance in semiarid ecosystems (Shinneman and Baker 2009, Li et al. 2015). Nonnative species often garner a foothold over native species due to their ability to thrive under harsher conditions with fewer resources and their ability to be prolific reproducers (Marushia et al. 2012).

The collection of baseline information allows managers to track the spread of known populations and identify new infestations in order to evaluate the effectiveness of management actions or treatments. Early detection allows managers to employ a rapid response while the populations are still small (Hamilton et al. 2013).

3.4.1 Nuisance and Nonnative Wildlife

Wild horses (*Equus caballus*) and burros (*E. asinus*) are managed and protected by the Wild Free-Roaming Horses and Burros Act of 1971 (16 U.S.C. 1331-1340). When there was an overpopulation, it was authorized to kill excess animals if it was the only practical way and to keep the population to a minimal feasible level (Michaels 2018). The act was amended by the FLPMA and the Public Rangelands Improvement Act of 1978. The act requires for the protection, management, and control of wild free-roaming horses and burros on public lands. Animals were destroyed if they were old, sick, or lame or had not been adopted under an adoption program. Due to public outcry, the act was amended in 1988 to prohibit federal funding of the destruction of healthy animals (e.g., horses and burros that were not adopted). In 2005, the Consolidated Appropriations Act amended the act again, allowing BLM to sell an unlimited number of animals that were over 10 years old or had been up for adoption three times without being adopted. Unfortunately, the market for horses and burros changed by 2007, and by 2017 the rangelands had 72,674 animals, which exceeded the 45,959 carrying-capacity (Michaels 2018).

During the 2021 fiscal year and as of 1 March 2021, BLM spent approximately \$112 million on the care and gathering of horses and burros, with an estimated population of 86,189 animals nationwide. BLM conducted fertility control on more animals in 2021 than in prior years—a total of 1,160 animals—attempting to slow the population growth and reduce the need to remove animals. Three fertility control treatments were used by BLM in 2021, requiring one of two

methods of administering the fertility control: dart or catch-treat-release. Porcine zona pellucida was the most used fertility control; however, it is only effective for approximately half as long as GonaCon (a gonadotropin-releasing hormone), which if followed up with boosters can be effective for up to five years. In 2021, BLM utilized intrauterine devices for the first time, which is a long-lasting fertility control that does not require a booster. In an effort to develop better and longer-lasting fertility controls requiring fewer treatments that could be effective in more herds, BLM continues to support research in this area (BLM 2021).

In addition to gathers and fertility control, BLM increased off-range pastures by 5,000 spaces and off-range corrals by 8,500 spaces. Off-range pastures can support up to 43,888 animals, and the capacity of off-range corrals is up to 28,245 animals. The purpose of pastures and corrals is to provide care for gathered animals. Off-range pastures provide large, free-roaming environments for long-term care of unadopted animals. Off-range corrals provide temporary placement for gathered animals, where they are prepared for “domestic life” and made available for adoption. In 2021, 5,698 animals were adopted, and over half of those adoptions were through the Adoption Incentive Program. The purpose of this program is to encourage qualified adopters to adopt untrained animals, receiving up to \$1,000 per adoption. BLM’s goal with the Adoption Incentive Program is to reduce costs for unadopted and untrained animals, focusing resources on the overpopulation (BLM 2021).

In 2022, BLM is planning to conduct the largest gather to date, attempting to gather at least 22,000 animals. Of these, 2,300 animals are planned for fertility control and will be released, but the remaining animals will be put up for adoption. If the animals are not adopted, then they will be put in off-range care, which currently supports approximately 59,000 animals. Due to emergency actions to save animals from worsening drought and wildfires, while protecting critical habitat on public lands, the BLM budget for managing these horse and burro populations was increased by 31 percent (Outdoor Life 2022). Ultimately, it is the policy of Congress that wild free-roaming horses and burros shall be protected from capture, branding, harassment, or death, and to accomplish this they are to be considered in the area where presently found, as an integral part of the natural system of the public lands.

California contains 33 geographic herd areas where wild horses and burros lived when the Wild Free-Roaming Horse and Burro Act was passed in 1971. One herd area overlaps the southern portion of the CMAGR (Figure 3-19). In a subset of herd areas, known as herd management areas (HMAs), through its land use plans, the BLM has identified HMAs that are suitable for the long-term management of wild horses and burros.

California has 22 HMAs on the BLM-administered lands. Each HMA has been studied to determine appropriate management levels for its wild horses and burros. The Chocolate–Mule Mountains HMA is located east of the CMAGR, along the Colorado River bordering the Picacho State Recreation Area west of Yuma, Arizona (Figure 3-19). As of 2012, this HMA contained 121 wild burros. The burros in these areas are believed to originate from mining operations in the 1800s. With introduction of the railroad and abandonment of the mines, miners abandoned their animals into the foothills (BLM 2012a, b). This HMA encompasses a total of 159,000 acres; 127,600 acres are within the BLM-administered lands (BLM 2007).



Nuisance or introduced bird species and others typically associated with or tolerant of human development include the Eurasian collared-dove (*Streptopelia decaocto*) and common raven (*Corvus corax*) (CMBC 2013). The common raven, which has been implicated throughout southern California deserts as a predator of desert tortoises, is relatively common, having been detected on 23 percent of transects surveyed (CMBC 2013).

A 2014 INRMP working group identified 11 invasive plant species of concern for the CMAGR: Sahara mustard (*Brassica tournefortii*), red brome (*Bromus madritensis* ssp. *rubens*), Lehmann lovegrass (*Eragrostis lehmanniana*), Arabian grass (*Schismus arabicus*), Russian thistle (*Salsola tragus*), buffelgrass (*Pennisetum ciliare*), storksbill (*Erodium cicutarium*), tamarisk (*Tamarix* spp.), Mediterranean splitgrass (*Schismus barbatus*), tansy mustard (*Descurainia pinnata*), and flixweed (*Descurainia sophia*). In 2015, fieldwork began on mapping the vegetation of the CMAGR, along with creating a flora specimen collection (Malusa and Sanders, in progress). The range is visited in January, March, and September, during which specimens are collected. The structure and relative dominance of perennial species within a vegetation type are recorded while taking samples called “rapid assessment” plots. Time permitting, annuals are also recorded, and note is taken about invasives. In addition, collections of all

species were made from several dozen locales as part of documenting the entire flora of the CMAGR. With the project nearly completed as of September 2022, 4 of the 11 invasive plant species listed above, Sahara mustard, Arabian grass, tamarisk, and tansy mustard, were documented to be widespread over the CMAGR. The other seven species were either entirely absent (Lehman lovegrass, buffelgrass, Mediterranean splitgrass, flaxweed) or rarely encountered (red brome, Russian thistle, storksbill). The latter three species have long been present in southeastern California, and despite no shortage of disturbed habitat on the CMAGR (e.g., training areas and targets), these species were mostly absent from the range, likely because of aridity.

Of these four widespread species, tansy mustard is an opportunistic weed, but it is a native species and not listed as invasive by the California Invasive Plant Council (Cal-IPC); perhaps its inclusion on the list was in error.

Arabian grass is a widespread and common annual weed in open sandy soils. Throughout the range. It is easily confused with Mediterranean splitgrass, which is widely naturalized on the coastal slope of southern California but uncommon in the desert and which was not found during surveys despite making many *Schismus* collections. Arabian grass is introduced from North Africa and the Middle East, with the earliest California record from 1935 in Fresno County; however, the first Imperial County record was not made until 1973. On the CMAGR, it can be considered a naturalized species that occurs in so many places that it is beyond human control.

There are two species of tamarisk on the CMAGR, *Tamarix aphylla* and *T. ramosissima*. *T. aphylla* is commonly called athel and is a tree introduced from North Africa and the Middle East. This species is often planted in the California deserts because it is more tolerant of heat, drought, and soil salinity than any other available shade tree. Malusa and Sanders (in progress) found this species only twice, both times on roadsides, so they may have been persisting from old plantings, though there was no direct evidence of that. When planted it is often in a row, as a windbreak or to shade a building, but these were both solitary plants in places where it was not obvious that shade would be wanted or needed. This species is not as successful in naturalizing as its weedy congener *T. ramosissima* but will do so occasionally usually along washes.

T. ramosissima, known as salt cedar, is an introduced weedy shrub, locally common in alkaline clay soil near the Coachella Canal and occasionally along washes elsewhere. Formerly it was common before the canal was concrete lined, when water leaked at numerous points, but many of those thickets are now dead. The light, fluffy seeds are wind dispersed and so the species can appear anywhere surface moisture remains long enough to germinate and grow seedlings, even far from established plants and in places where the species cannot last more than a year or two. It was occasionally found in remote canyons where seasonal water allowed it to grow, but in such cases, it was an uncommon and struggling species.

Sahara mustard is an occasionally abundant spring annual weed in sandy soil throughout the range. Especially common on wash edges, sandy alluvial slopes, and along roadsides, it is also occasionally found on rocky slopes, suggesting that it has been present in the CMAGR long enough to disperse from disturbed areas. During dry winters, it is mostly absent from the CMAGR, as are most spring annuals; this is especially so on the southeast of the range, where

winter rains are less common than at the northwest end of the range (Malusa and Sanders in progress). It is native to North Africa and the Middle East but was introduced to California (probably with potted date palms) in the early 20th century (Minnich and Sanders 2000). This species has been proven to have negative effects on native flora and fauna such as fringe-toed lizards and Coachella Valley milkvetch (Barrows and Murphy 2017) and can reach densities allowing the spread of fire (Malusa 2018). However, although it was widespread in the CMAGR and documented in 74 of the 303 rapid assessment plots for the vegetation survey, it was rarely a dominant or codominant species (Malusa and Sanders, in progress). Of the 74 plots holding Sahara mustard, it was at 2 percent or greater ground cover in only 11 plots; of these 11, only 3 held the mustard at 10 to 15 percent cover. Of these three plots, two were close to the Coachella Canal and had moderate levels of road disturbance, but one was far more remote. This was near the “narrows” of upper Mammoth Wash, a popular area of trespass for people riding all-terrain vehicles. These vehicles have forged a new path up a steep slope out of the wash just above the narrows, and the resulting disturbance is associated with numerous patches of Sahara mustard. This area needs more frequent patrols by Conservation Law Enforcement Officers to prevent the further spread of Sahara mustard.

Because the Sahara mustard is an invasive of special concern, Malusa and Sanders utilized a smartphone application called GISCloud to record locations outside of the vegetation mapping rapid assessment plots. This method was pioneered on the Barry M. Goldwater Range – West and allows anyone with the application on a cell phone to rapidly take georeferenced photographs and data. Once within cell range, the data are automatically uploaded on a Web map at www.portal.GISCloud.com (search maps for Goldwater).

Malusa and Sanders (in progress) recorded four invasive species that were not anticipated and therefore not included on the 2014 INRMP working group watch list of 11 invasive plant species (above). These four species are:

- Sow thistle (*Sonchus asper*, *S. oleraceus*)
- Bermuda grass (*Cynodon dactylon*)
- Canary grass (*Phalaris minor*)
- Sudan grass (*Sorghum sudanense*)

These species were rarely seen. Bermuda grass and Sudan grass were recorded from only one location each. The sow thistle and canary grass are more common but still scarce, and without the continuing seed rain from the Imperial Valley these species would probably cease to be present. All four species are longtime inhabitants of the Imperial Valley and likely are waifs that won't spread further due to very arid climate of the CMAGR. All these invasive species were collected and curated by the researchers, with the exception of sorghum, which was in poor condition. The records can be found in Consortium of California Herbaria at <http://ucjeps.berkeley.edu/consortium>. When these data are combined with the vegetation map and flora, range management will be able to focus control efforts, if any, on areas known to be at high risk of invasion, a metric which can vary with the dispersal capabilities of the invasive species (Brooks and Berry 2006; Minor and Gardner 2011).

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4.0 CMAGR NATURAL RESOURCE MANAGEMENT PROGRAM

MCAS Yuma's natural resources management philosophy towards the CMAGR is to maintain processes and programs that prevent long-term damage or degradation of the range, allow the range to sustain current and future military training requirements, and achieve the conservation objectives of relevant regulatory requirements. Goals that MCAS Yuma has for the CMAGR's natural resources conservation and management programs include:

- Meeting the military mission of the CMAGR.
- Avoiding and minimizing adverse effects on federally listed species and other significant natural resources through the implementation of programmatic instructions (published rules and guidelines for land users) and the evaluation of potential impacts of new activities and projects through the NEPA process (MCO 5090.2 – V11 [HQMC 2018]).
- Improving native habitat maintenance, restoration, and enhancement through the implementation of programmatic conservation plans, fire management, nonnative species control, erosion control, pollution prevention, etc. (MCO 5090.2 – V11 [HQMC 2018]).
- Inventorying, monitoring, and surveying to understand and track the range's species and habitats, while using these data to evaluate the status, quality, distribution, and trends of those resources and management plans (e.g., free-roaming equine monitoring, vegetation mapping, desert tortoise surveys, and small-mammal, reptile, and amphibian study).
- Ensuring compliance with the appropriate natural resource laws and regulations, agency guidance, relevant orders, and binding regulatory opinions and permits.
- Remaining cognizant of regional natural resources initiatives and trends, maintaining involvement in those that relate to the CMAGR (e.g., DRECP and desert tortoise and pronghorn recovery plans).
- Remaining cognizant of public opinion and interest groups where these intersect with MCAS Yuma or the CMAGR.
- Maintaining a professional and mutually productive relationship with the regulatory authorities who monitor and advise on the CMAGR.
- Achieving long-term desert tortoise management and conservation goals and objectives defined in the most up-to-date recovery plan (USFWS 2011).
- Maintaining current natural resources data inventories that support mission planning and land use decision making on the CMAGR (Table 4-1).
- Maintaining open lines of communication with MCIWest and other DoD organizations to share information and experiences, as well as coordinating actions on matters of mutual interest.

Natural resource management programs, policies, objectives, and action items developed specifically for the CMAGR are discussed in this section. The discussion of each existing or proposed program addresses existing or potential management issues as well as program objectives, metrics for evaluating the effectiveness of the program, and specific actions necessary to implement each program. These programs have been developed and prioritized to sustain the military's operational and support requirements, to achieve overarching natural

resources management goals, and incorporate the principles of ecosystem management including adaptive strategies.

Program areas include:

- 4.1 INRMP Implementation
- 4.2 NEPA Review
- 4.3 Federal ESA Compliance
- 4.4 Threatened or Endangered Species and Critical Habitat
- 4.5 Other Special Status Species
- 4.6 Migratory Birds and Eagles
- 4.7 Bird/Animal Aircraft Strike Hazard Reduction Program
- 4.8 General Wildlife
- 4.9 Nuisance and Nonnative Wildlife
- 4.10 Vegetation
- 4.11 Invasive Plant Species
- 4.12 Wildland Fire Management
- 4.13 Wildlife Watering Sources
- 4.14 Ecosystem Management
- 4.15 Soils
- 4.16 Climate Change
- 4.17 Cultural Resources
- 4.18 Conservation Program Geographic Information Services
- 4.19 Cooperative Initiatives
- 4.20 Recreation
- 4.21 Law Enforcement and Control of Public Access

In compliance with MCO 5090.2 (USMC 2018), this chapter provides performance-based objectives, metrics, and actions to ensure natural resource management programs are planned, funded, executed, periodically evaluated for efficacy, and adjusted as necessary to meet evolving military mission requirements, as well as natural and anthropogenic changes to the CMAGR landscape. Terminology used in the context of natural resource management programs in this section are as follows:

- **Objectives:** Description of a desired future end-state or successful outcome that supports a CMAGR INRMP goal or USMC/DoN policy or other relevant law or regulation
- **Metrics:** Description of a standard, quantity, or timeframe for attaining the objective
- **Actions:** Description of a specific step, practice, or method for satisfying an objective

Information and data gaps relevant to the management of resources such as ecosystem health and biodiversity at CMAGR identified during the planning process for this INRMP are summarized in Table 4-1.

Table 4-1. Information and Data Gaps Identified during the Integrated Natural Resource Management Plan Planning Process

Resource	Incomplete or Unavailable Information/Data
Earth Resources	Soil series data are incomplete.
Water Resources	Mapping of certain water features (e.g., tinajas and playas) is incomplete and water quality data are limited. Actual water volume, water quality, and sustained renewability of the basins are poorly known because a limited number of wells have been drilled on the range.
Climate and Air Resources	Data are available for the general region, but there are no weather stations located on the CMAGR; therefore, site-specific data are not available.
Vegetation	Fieldwork for a comprehensive vegetation map and GIS database for the CMAGR began in early 2015 and is expected to be completed by 26 September 2022. The final report will also include a dichotomous key to the vegetation associations. All plant species on the range shall be documented by specimens made available to the Installation Representative as an herbarium collection at the University of California at Riverside and Arizona Western College in Yuma, Arizona.
General Wildlife and Wildlife Habitat	The occurrence, distribution, and overall health of many wildlife species on the CMAGR, including invertebrate species, reptiles, and game species have been detailed in general and species-specific surveys, EAs, and clearance surveys. The effects of nonnative or nuisance species (e.g., common ravens and wild burros) on native wildlife are not completely understood. The locations and characteristics of wildlife movement corridors within the CMAGR and from adjacent areas are not well documented.
Special Status Species	Data continue to be collected for protected species, but the potential occurrence and distribution of such species cannot be known definitively because some are migrants. The effects of military and unauthorized uses on migratory birds, bat roosts, sensitive habitats over time are not well understood; however, long-term monitoring of species (e.g., desert tortoise) can help determine overall population trends.
Wildland Fire Management	The extent to which invasive plants have spread across the CMAGR is ongoing and the Wildland Fire Management Plan has been developed and implemented.
Law Enforcement Management	Law enforcement actions are tracked, but the extent to which unpermitted access or unlawful activities are occurring is difficult to quantify. Similarly, while the extent and type of unauthorized activity can only be documented based on apprehensions, the magnitude, location, and resource damage effects can only be interpolated based on known data.

GIS – geographic information system; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **EA** – Environmental Assessment

Natural resource management program objectives, metrics for success, and actions presented in this section were developed through meetings and discussions with the MCAS Yuma, USFWS, CDFW, and BLM resource managers, monitoring experts, and other stakeholders. This INRMP stresses the importance of regional monitoring partnerships and protocol standardization for understanding landscape-scale ecosystem changes on the CMAGR and Mojave Desert.

Natural resources management programs are driven by the need to maintain sufficient natural areas and varied vegetation that will allow sound and realistic tactical training, as well as support sound ecological management. Natural resource management programs must balance

military mission requirements established under Title 10 U.S.C. with federal resource conservation laws such as the Sikes Act, ESA, and MBTA.

4.1 INRMP Implementation

Land jurisdiction within the CMAGR previous to the FY14 NDAA followed a complicated checkerboard pattern with only approximately 51 percent of the land administered by the DoN. Having multiple jurisdictions with varied administrative oversight of the CMAGR led to challenging land management. Following the FY14 NDAA, all withdrawn land previously administered by the BLM within the CMAGR is now managed by the DoN in accordance with this INRMP.

The CMAGR's natural resource management has been mostly limited to actions taken for the benefit of protected or special status species (e.g., desert tortoise); however, small mammal, reptile, and amphibian surveys, as well as vegetation mapping have also been completed. This revised INRMP continues to rely heavily on the most current tortoise survey reports, regional data sets (e.g., USFWS, VegCAMP, NRCS, and USGS) and 2013 LEIS (DoN et al. 2013).

Over the next five-year period, factors upon which this INRMP is based on may change, including military mission requirements, federal list of threatened and endangered species, information available for listed species and their ecosystems, as well as an understanding of anthropogenic impacts. The implementation of this INRMP, will follow an adaptive management approach that acknowledges uncertainty, monitors the various INRMP components, and lessons learned with the end goal of improving the CMAGR's future management actions and ecosystem health.

Objective: Long-term sustainability of mission capability, species populations and ecosystem functions, and regulatory compliance.

Metric: Execution of natural resource programs, action items and projects, as well as successful completion of prescribed interagency annual reviews and five-year review for operation and effect.

Action 1: Prioritize, pursue funding opportunities, and implement projects as outlined in this INRMP.

Action 2: This INRMP is to be reviewed annually for operation and effect. The parties in the review process should at a minimum include MCAS Yuma, USFWS, and CDFW. The annual review is intended to assess its overall effectiveness, verify there has been no net loss in the capability to support the military mission, and provide information to support a comprehensive review for operation and effect as required by the Sikes Act. Annual reviews will assess the focus areas discussed in Sections 4.2 through 4.21. Annual review results will be provided to all parties and will be catalogued in Appendix D.

4.2 NEPA Review

All major federal actions are subject to the NEPA review process and must consider the potential environmental impacts of the actions on natural resources, as well as reasonable alternatives that would meet the action's purpose and need.

Objective: Provide timely, data-driven analysis of the potential effects from federal actions.

Metric: Consistently follow the NEPA planning process, applicable laws and regulations to evaluate potential impacts from an ecosystem management perspective, thereby mitigating risk or liability.

Action 1: REIR, EA, and/or EIS reviews will 1) identify potential effects of the proposed action from a local and regional ecosystems management perspective, 2) identify less damaging alternatives, 3) identify other laws and regulations that may be applicable, 4) ensure that adequate mitigation is planned, if required, 5) assess the level of regulatory interface required, and 6) assess consistency with natural resources management goals, objectives, BOs, and conservation programs.

4.3 Federal ESA Compliance

MCAS Yuma regularly consults with the USFWS to ensure that USMC actions on the CMAGR are not likely to jeopardize the continued existence of any federally listed endangered, threatened, or proposed species and comply with Sections 7 and 9 of the ESA. Pursuant to Section 7 of the ESA, federal agencies must consult with USFWS if their action "may affect" a federally listed endangered or threatened species (50 Code of Federal Regulations [CFR] 402). Such consultations may be formal or informal. When required by Section 7 of the ESA, the installation prepares a Biological Assessment of the effects of a proposed action on listed species. Section 9 of the ESA prohibits the "take" of a threatened or endangered species. A take includes the direct killing, harming, or harassing of a species, or destruction of habitat that may be important for the species' survival or recovery.

Objective: Maintain viable populations of federally listed threatened or endangered species and participate in regional recovery efforts.

Metric: Implementation of management practices that protect and enhance the recovery of federally listed threatened or endangered species. USFWS BO conservation measures are consistently implemented, and regional conservation efforts supporting delisting or down listing of federally listed species are considered.

Action 1: Adhere to conservation measures and relevant avoidance measures identified in all applicable USFWS BOs (Appendix E).

Action 2: Manage federally listed threatened or endangered species and their habitats to prevent jeopardy to the species and to assist in their conservation and recovery.

Action 3: Manage federally listed threatened or endangered species and their habitats in a manner that minimizes impacts to both mission and species.

Action 4: Proactively collect information on presence or absence, location, habitat availability and suitability, and life history requirements of federally listed threatened or endangered species, and maintain and update these data.

Action 5: Develop and maintain a robust GIS database that will be updated as survey data become available, to document spatial and temporal distribution of federally listed threatened or endangered species.

4.4 Threatened or Endangered Species and Critical Habitat

4.4.1 *Desert Tortoise*

MCAS Yuma has historically contributed to the USFWS's long-term monitoring program, which includes annual desert tortoise surveys that are organized by the USFWS Desert Tortoise Recovery Office (DTRO). The DTRO was established to address population declines and focus on recovery subsequent to the General Accounting Office's December 2002 audit of recovery actions and 2004 Desert Tortoise Recovery Plan Assessment (USFWS 2013).

The desert tortoise recovery program includes range-wide, long-term monitoring to determine whether recovery goals are met based on population trends. The USFWS oversees the implementation of the line-distance sampling protocol and establishes the number and location of transects to be surveyed based on available funding from recovery partners, including MCAS Yuma.

Objective 1: Maintain compliance with all applicable desert tortoise BOs (Appendix E).

Objective 2: Monitor and maintain existing populations of desert tortoise, as well as monitor and maintain designated critical habitat on CMAGR.

Action 1: Continue to participate in annual desert tortoise surveys. These surveys will continue to inform population trends in accordance with the requirements of all applicable USFWS BOs (Appendix E).

Action 2: Map desert tortoise population, densities, habitat parameters, and threats across the range.

Action 3: Continue to participate in the Desert Tortoise Management Oversight Group and the California Recovery Implementation Team. Develop project proposals to assist with the species recovery.

4.4.2 *Sonoran Pronghorn*

The Sonoran pronghorn subspecies was one of the first species to gain ESA protection in the U.S. and is recognized by several federal, state, and international lists. It was listed as endangered throughout its range on 11 March 1967 (32 FR 4001) under the Endangered Species Preservation Act of 15 October 1966. It was subsequently included on a list of endangered species published in 1967, and in the Endangered Species Conservation Act of 1970. When the ESA was signed into law in 1973, the Sonoran pronghorn was placed on the list

as an endangered species under Section 4(c)(3) of the ESA, the “grandfather clause.” Sonoran pronghorn historically occurred throughout most of southwestern Arizona, southeastern California, and northwestern Sonora, Mexico.

Recovery efforts officially began in 1975 with the first meeting of the Sonoran pronghorn recovery team. The Sonoran Pronghorn Recovery Plan, dated 30 December 1982, was prepared for USFWS by the recovery team (USFWS 2015a). In summer 2002, the U.S. population of Sonoran pronghorn was almost extirpated due to the most severe drought on record in southern Arizona. In response to the near extirpation of the U.S. population, the USFWS, Arizona Game and Fish Department, MCAS Yuma, and other cooperating agencies began aggressive conservation actions including construction of water developments and forage enhancement plots, supplemental feeding, and a captive breeding program (USFWS 2013).

With the success of the captive breeding pens, the Sonoran pronghorn recovery team initiated releases into the wild in 2006. As of March 2022, 399 pronghorn have been released into the wild. Current numbers at the breeder facilities are 56 adults at Cabeza pens and 26 adults at KOFA pens; as of March 2022, this number does not include fawns. The current wild endangered population on the Cabeza is at 232 animals as of March 2022. Under Section 10(j) of ESA, the USFWS has established three nonessential experimental populations (NEPs). They include the KOFA National Wildlife Refuge, BMGR East Saucedo, and Vekol Valley. Current estimated numbers for the NEPs are as follows: KOFA National Wildlife Refuge (140), BMGR East Saucedo (40), and Vekol Valley (20). The total estimated number of pronghorn is 432, which includes the endangered and NEPs combined.

A second revision of the Sonoran pronghorn recovery plan, as a draft, was requested for comment on 2 July 2015 (USFWS 2015a). The final revised plan sets objective population goals and thresholds in the U.S. and Mexico and provides objective, measurable criteria for down listing and delisting the species; incorporates expanded threat and viability analyses; includes existing, expanded, and new site-specific management and recovery actions, emphasizing habitat management; estimates time and cost required for recovery; identifies partners and parties responsible for implementation of recovery actions; identifies gaps in the information needed for management and recovery; and pending genetic support from ongoing research, recommends establishment of a California Reintroduction Management Unit on the Chuckwalla Bench (USFWS 2015a). During a meeting and trip to CMAGR on 2 February 2022, personnel from MCAS Yuma, USFWS, CDFW, Safari Club International, Desert Wildlife Unlimited, the San Diego Natural History Museum, and the Living Desert toured existing habitat conditions on the Chuckwalla Bench, which also included stops at a wildlife water location and a potential release site. Discussions during this meeting included identification of potential roles and limitations, lessons learned from managing pronghorn in Arizona, the need to modify existing wildlife waters to make them pronghorn friendly, release site requirements, timelines, and next steps. MCAS Yuma/MCIWest/HQMC will review the draft 10J ruling in advance of its placement on the FR. CMAGR has received a Draft 10J proposal for reintroduction of a NEP herd on the Chuckwalla Bench and are currently reviewing this document. An analysis of habitat variables (e.g., vegetation composition and landscape) was conducted for three sites in southern California to

determine their suitability for reintroducing Sonoran pronghorn (USFWS 2015a). The Chuckwalla Bench (on and adjacent to CMAGR) ranked highest, with suitable amounts of forage, water, and land protection. Rice Valley (approximately 40 miles northeast of CMAGR) ranked second, and Anza Borrego State Park (approximately 35 miles west of CMAGR) ranked third (USFWS 2015a).

Objective: Maintain participation in discussions related to regional Sonoran pronghorn recovery efforts.

Metric: Participation in regional Sonoran pronghorn recovery efforts.

Action 1: Pending decisions of other state and federal lead agencies, determine whether the reintroduction of a NEP of Sonoran pronghorn will be compatible with training mission objectives and designed to avoid conflicting with range operations.

Action 2: Assist in coordination and provide in-kind and financial support, if available, to the Sonoran pronghorn recovery team in any future efforts to support the management of a nonessential experimental population on the Chuckwalla Bench.

4.5 Other Special Status Species

For the purposes of this discussion, other special status species are those plants and animals that are proposed or identified as a candidate species for listing by the USFWS, listed as species of concern by the USFWS and/or CDFW, and/or California BLM's designated sensitive species list. More specifically for CMAGR are the monarch butterfly (*Danaus plexippus*), Couch's spadefoot toad, and Coachella Valley fringe-toed lizard, which are briefly discussed below. Federally listed threatened or endangered species are not included here, as they were described in Sections 4.4.1 and 4.4.2.

The California overwintering population of the monarch is a U.S. Forest Service sensitive species. In addition, the USFWS anticipates listing the monarch and simultaneously designating critical habitat by fall of 2024 (USFWS 2022). The *Monarch Conservation on Department of Defense Land in the West: Best Management Practices* was developed to minimize impacts on monarchs when considering broader goals for land management that align with the DoD's mission (Pelton et al. 2019). In the West, monarchs breed and lay eggs continuously from spring to fall, ending when the final breeding generation of adults migrate back to their overwintering grounds. However, the timing of when breeding begins and ends varies across the West. As such, a regionally appropriate monarch breeding habitat management timing was created. These timeframes are periods when management activities (i.e., mowing, burning, grazing, or using pesticides) are least likely to have negative effects on monarchs. For CMAGR, the best approximated timing window for implementing management activities is 30 November through 15 March (Pelton et al. 2019).

Although CMAGR is not known to be a breeding or overwintering site, several milkweed species grow year round in the desert Southwest, such as desert milkweed (*A. erosa*), rush milkweed (*A. subulata*), and whitestem milkweed (*A. albicans*), which are larval host plants for this species. Monarchs will most likely migrate through the area or stop over to utilize nectar sources

to obtain fuel for adult monarch activities (breeding, migration, and overwintering), as opposed to breeding or overwintering on CMAGR.

Unlike their dependency on milkweed species for the larval stage of their life cycle, adult monarchs are generalists feeding on nectar from a variety of sources (Pelton et al. 2019). Given the location of CMAGR in relation to the migration of monarchs from the Rocky Mountain region to coastal California, some potential native nectar-source plant species could include common sunflower (*Helianthus annuus*), flowering between July and August; desertbroom baccharis (*Baccharis sarothroides*), flowering between January and February; mule fat (*B. salicifolia*), flowering year round; rubber rabbitbrush (*Ericameria nauseosa*), flowering between July and October; and yellow spiderplant (*Peritoma lutea*), flowering between May and August (Pelton et al. 2019; Jepson 2023). However, common sunflower, desertbroom baccharis, and yellow spiderplant are anticipated to be less significant sources of nectar on CMAGR due to fewer known locations of these species existing in the area (Jepson 2023).

Couch's spadefoot toad, which occurs along the UPRR railroad tracks on the CMAGR's southwestern boundary, may occur on the range but surveys are problematic due to the specific meteorological conditions necessary for successful detection (i.e., monsoonal rains that leave standing water for breeding pools). Golden eagle populations may occur on and around the range; however, this species has not been reported on the CMAGR. Other species that may occur within sand dune habitat on the range are the Colorado fringe-toed lizard (*Uma notata*) and the Mojave fringe-toed lizard (*U. scoparia*). Both of these are California species of special concern and BLM sensitive species.

Although the Coachella Valley fringe-toed lizard (*U. inornata*) requires habitat similar to that of the Mojave fringe-toed lizard, the species prefers fine, windblown, and deep sand dune habitat, with sand grains typically measuring 1 millimeter or less. The Coachella Valley fringe-toed lizard is a federally threatened and California endangered species, with critical habitat located approximately 37 miles northwest of CMAGR. This species has more restrictive habitat requirements than its Mojave counterpart; thus, its range lies only within Coachella Valley, which gives the species its name. The range of this species extends as far east as the Coachella Canal. However, due to development and agriculture, the range of the Coachella Valley fringe-toed lizard has been greatly reduced and become isolated (USFWS 1985). Therefore, it is not anticipated that the Coachella Valley fringe-toed lizard will occur on CMAGR.

Objective: Manage the habitat and populations of special status species known to occur or likely to occur on the CMAGR to reduce conflicts between the military mission and natural resources.

Metric: Actions comply with all applicable federal laws and regulations for the protection of special status species.

Action 1: Inventory and monitor special status species and their habitats to establish a baseline from which conservation and management strategies can be devised.

4.6 Migratory Birds and Eagles

The MBTA of 1918 is the primary legislation established to conserve migratory birds in the U.S. It implements the U.S.'s commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resources. The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. The species of birds protected by the MBTA appear in 50 CFR 10.13. The FY03 NDAA directed the Secretary of the Interior to exercise his/her authority under the MBTA to prescribe regulations that exempt the Armed Forces from the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense. An MOU outlining agency responsibilities between the DoD and USFWS was signed on 31 July 2006 (USFWS 2006). Effective 30 March 2007, the USFWS published a rule authorizing the take of migratory birds in the course of military readiness activities provided such actions do not have a significant adverse effect on the population (72 FR 8931).

In 2018, the USFWS wrote a memorandum entitled *Destruction and Relocation of Migratory Bird Nest Contents* (USFWS 2018). This memorandum clarified the application of the MBTA (50 CFR §§ 703-712), which provided guidance for the public regarding the destruction and relocation of migratory bird nests and replaced the *Migratory Bird Permit Memorandum MBPM-2 on Nest Destruction* of 15 April 2003. The *Destruction and Relocation of Migratory Bird Nest Contents* memorandum clarified that the MBTA does not prohibit the incidental or unintentional take of migratory birds and/or their active nest contents. This allowed an individual or entity “to destroy an active nest while conducting any activity where the intent of the action is not to kill migratory birds or destroy their nests or contents” with some stipulations (USFWS 2018). One of the stipulations is that an individual or entity cannot remove eggs or chicks prior to nest destruction or relocate nests without first obtaining authorization. However, inactive migratory bird nests may be destroyed without a permit or other regulatory authorization. Descriptions of active and inactive nests are:

- *Active Nest* – a nest that contains viable eggs and/or chicks. A nest becomes active when the first egg is laid and remains active until fledged young are no longer dependent on the nest.
- *Inactive Nest* – a nest that is empty, contains nonviable eggs, or is being built but does not yet have an egg in the nest.

Permits are still required for relocating a nest rather than destroying the nest because “possession of any nest is prohibited under the MBTA without prior authorization.” Another instance when a permit may be required are ongoing projects that regularly need to intentionally remove or destroy nests.

In addition to the memorandum clarifying nest destruction and relocation, the USFWS published a proposed ruling in the FR for *Regulations Governing Take of Migratory Birds* (USFWS 2020b). The *Regulations Governing Take of Migratory Birds* examined the legal opinion “The Migratory Bird Treaty Act Does Not Prohibit Incidental Take” (also known as M-37050 or M-Opinion). As stated in this document:

The prohibitions of the Migratory Bird Treaty Act (16 United States Code [U.S.C.] 703) that make it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds, or attempt to engage in any of those actions, apply only to actions directed at migratory birds, their nests, or their eggs. Injury to or mortality of migratory birds that results from, but is not the purpose of, an action (i.e., incidentally taking or killing) is not prohibited by the Migratory Bird Treaty Act.

Also in 2020, the USFWS updated the list of protected bird species under the MBTA: FR final ruling *General Provisions; Revised List of Migratory Birds* (USFWS 2020c). The reason for revising the list was to remove or add species due to “new taxonomy and new evidence of natural occurrence in the United States or U.S. territories, removing species no longer known to occur within the United States or U.S. territories, and changing names to conform to accepted use.” On the revised list, 75 species were added and 8 species were removed, resulting in a net increase of 67 species. The total number of species protected under the MBTA is now 1,093.

In addition to the MBTA, BGEPA (16 U.S.C. 668) as amended in 1972 prohibits any form of possession or taking of bald or golden eagles (i.e., any part, nest, or egg), unless allowed by permit. The BGEPA defines “take” as to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. In September 2009, the USFWS announced a final rule on two new permit regulations that would allow for the take of eagles. The permits will authorize limited, nonpurposeful take of bald and golden eagles, which includes authorizing government agencies to disturb or otherwise take eagles in the course of conducting lawful activities (e.g., airport operations).

Objective 1: Maintain, restore, and enhance habitats upon which resident and migratory bird and eagle populations depend, emphasizing those that may be affected by military activities in compliance with Executive Order 13186, USFWS-DoD MOU (2006), and 72 FR 8931.

Metric: Compliance with all applicable laws and regulations for the protection of migratory birds and eagles, including the MBTA and the BGEPA.

Action 1: Avoid or minimize impacts to migratory birds and eagles and their habitats.

Action 2: Conduct presence/absence surveys periodically as part of an adaptive management strategy to better inform migratory bird management on the range.

Action 3: Develop, strive to implement, and periodically evaluate conservation measures for management actions to avoid or minimize incidental take of migratory birds and eagles, and, if necessary, confer with the USFWS on revisions to these conservation measures.

Action 4: Participate in regional or national inventory and monitoring programs (e.g., Breeding Bird Surveys, Breeding Biology Research and Monitoring Databases, Christmas bird counts, bird atlas projects, or game bird surveys) where practicable, feasible, and accessible with consideration toward safety and security.

4.7 Bird/Animal Aircraft Strike Hazard Reduction Program

The Bird/Animal Aircraft Strike Hazard (BASH) Reduction Program (StaO 3750.1D) was created to ensure an integrated bird control, hazard abatement, and incident reporting. It is designed to minimize aircraft exposure to potentially hazardous bird and animal strikes. It is governed by the BASH Working Group, chaired by the Station Director of Operations. The BASH Working Group meets quarterly to assess the status of the BASH Reduction Program and recommend improved procedures and coordination. The BASH Working Group consists of:

- Station Director of Operations (Chairperson)
- Airfield Operations Officer
- Air Traffic Control Facility Officer
- Conservation Manager
- Natural Resources Specialist/Soil Conservationist
- Station Aviation Safety Officer
- Installation and Logistics
 - Facilities Requirements Branch
 - Facilities Maintenance Branch
- Community Plans and Liaison Office
- Tenant Unit Representatives
 - Marine Aircraft Group 13 Aviation Safety Officer
 - Marine Aviation Weapons and Tactics Squadron 1 Aviation Safety Officer
 - Marine Fighter Training Squadron 401 Aviation Safety Officer
 - Marine Operational Test and Evaluation Squadron 1 Aviation Safety Officer

The BASH Reduction Program requires the Conservation Manager to maintain permits for dispersal and depredation program and ensure properly trained personnel are available when required. The Natural Resources Specialist/Soil Conservationist/Conservation Law Enforcement Officer reviews all locally generated BASH reports and attempts to identify all bird remains; reviews low-level routes, training areas, and changes to existing routes/areas for BASH potential liaises with USFWS, Audubon Society, and other agencies to provide additional information on migratory, local, and seasonal bird activities; assists the Station Aviation Safety Officer with the information and education program; sends all remains found on MCAS Yuma to the Smithsonian Institute for office review and cataloging; speaks with local farmers on MCAS Agricultural Leases surrounding the airfield and mandates that they grow nonhabitat/food-producing crops and limit the amount of standing water to the maximum extent practicable; notifies the Airfield Operations Officer of any habitat disturbances that may impact airfield safety; conducts bird dispersal and depredation activities when required; maintains records of control efforts and methods; and maintains necessary nonlethal and lethal equipment and devices required for bird abatement, dispersal, and depredation.

Objective: Minimize bird strikes from aircraft on the CMAGR.

Metric: Implement efforts to minimize the possibility of harm to life, property, and the environment through compliance with the BASH Reduction Program (StaO 3750.1D).

Action 1: Maintain the existing MBTA depredation permit(s).

Action 2: Update as necessary and periodically evaluate possible improvements to this successful program that might further reduce BASH incidents.

Action 3: Implement the MBTA *Destruction and Relocation of Migratory Bird Nest Contents* (USFWS 2018), when applicable, to minimize the possibility of harm to life and property by destroying or relocating (with prior authorization) nests that could be problematic under the BASH Reduction Program (StaO 3750.1D).

4.8 General Wildlife

Wildlife species management is primarily accomplished by managing the habitat on which wildlife depends. MCAS Yuma will coordinate with the CDFW and USFWS to identify, prioritize, and implement habitat enhancement projects targeted for particular species or broad classifications of species (e.g., birds, reptiles, and invertebrates). Programs to manage wildlife habitat include invasive plant control, population density surveys, and provision of guzzlers in strategic locations.

Objective: Implement various wildlife management strategies (e.g., inventory, monitoring, population modeling, assessment, and evaluation) to better understand local and regional wildlife dynamics.

Metric: Understand and support wildlife distributions.

Action 1: Inventory and monitor distribution and abundance of reptiles, birds, amphibians, and small mammals.

Action 2: Maintain vegetation known to support wildlife.

Action 3: Restore or enhance vegetation outside of heavy-use areas where appropriate, especially in degraded xeroriparian or upland areas that serve as wildlife corridors.

4.9 Nonnative and Nuisance Wildlife

Wild burro signs were recorded on the CMAGR in September 2015 by MCAS Yuma's Cultural Resources Manager. Nonnative and nuisance bird species include the Eurasian collared-dove and common raven (CMBC 2013). The common raven, which has been implicated throughout southern California deserts as a predator of small desert tortoises, is relatively common, having been detected on 23 percent of transects surveyed in 2013 (CMBC 2013). Water sources are few and far between, and there are relatively few large trees, a handful of abandoned vehicles, and two electrical utility lines run through the center of the range to provide nesting. The CMAGR is surrounded by large parcels of uninhabited, BLM- and state-owned lands and is part of the final Programmatic EA for adaptive management of the common raven on DoD lands in the California desert. In an effort to thwart raven establishment, measures will be employed to discourage further settlement by common ravens, as discussed in Section 3.3.3, "Special Status Species" (CMBC 2015).

Objective: Develop a nonnative and nuisance species management program.

Metric: Nonnative and nuisance species monitoring metrics and set targets are developed to ensure management strategies are meeting goals and objectives.

Action 1: Work in partnership with the BLM to control the wild burro populations. The BLM completed a Categorical Exclusion to move forward with trapping wild burrows on the CMAGR beginning in spring/summer 2022.

Action 2: Inventory, monitor, and control raven populations.

Action 3: Develop pest species management programs as needed to include pest animals (e.g., rabbits, skunks, raccoon, squirrels, coyotes, feral dogs, feral cats, and ravens).

4.10 Vegetation

Fieldwork for a comprehensive vegetation map and GIS database was initiated in early 2015 and is expected to be completed in September 2022. The GIS database will include a dichotomous key of vegetation associations. Plant specimens will be delivered to the herbarium collection at the University of California at Riverside and Arizona Western College in Yuma, Arizona.

Vegetation field sampling and mapping will follow the protocols established for BMGR West (Malusa 2012), which were developed from similar mapping efforts on the BMGR East, Cabeza Prieta National Wildlife Refuge, and Organ Pipe Cactus National Monument (Warren et al. 1981, Malusa 2003, McLaughlin et al. 2007, Osmer et al. 2009). It is expected that these protocols will be modified by new developments or innovations in desert vegetation field sampling and mapping methodologies. It is also expected that the map will be similar in detail to those published for Joshua Tree National Park (Keeler-Wolf et al. 2005) and Anza Borrego Desert State Park (Keeler-Wolf et al. 1998). The field effort will include the collection of invasive vegetation information that will include the extent and distribution patterns of invasive species, including areas where they are still absent.

Objective: Establish a baseline inventory of vegetation on the CMAGR through mapping and GIS data development.

Metric: Maintain quality vegetation mapping.

Action 1: Complete vegetation mapping.

Action 2: Identify essential habitats for rare plants and wildlife. Monitor the condition of protected areas, areas at risk for type conversion, and invasive species distribution. Support the development of higher resolution habitat maps. Mapping efforts may be focused on areas known to be at high risk of invasion (Brooks and Berry 2006), including:

- Roads, trails, campsites and wash corridors
- Areas in proximity to other nonnative plant populations
- Recently or continually disturbed areas

- Areas of high management priority and protection (sensitive or endangered species communities)

4.11 Invasive and Nonnative Plant Species

The collection of baseline information allows managers to track the spread of known populations and identify new infestations to evaluate the effectiveness of management actions. Early detection of new species or infestations coordinated with a rapid management, while the populations are still small and manageable, is the ideal course of action.

Objective: Control the proliferation of invasive and nonnative vegetation to maintain mission capability and ecosystem health for threatened and endangered species and other special status species for both plants and wildlife.

Metric: Invasive and nonnative plant species abatement.

Action 1: Acquire reliable baseline data on the presence, distribution, and abundance of invasive and nonnative plant species.

Action 2: Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness.

Action 3: Treat and monitor areas most likely to impact ecosystem health or mission readiness.

4.12 Wildland Fire Management

Wildland fires on military lands are a risk to human lives, natural resources, military assets, and the military mission. Wildland fires contribute to soil erosion after the vegetative ground cover stabilizing the soil is removed. This loss of topsoil can lead to increased sedimentation and turbidity in surface water, loss of soil moisture and nutrients, and ground fires. Such fires leave the burned area vulnerable to the spread of exotic plants.

In accordance with DoDI 6055.06, MCO 5090.2 – V11 (HQMC 2018), and the Sikes Act, a Wildland Fire Management Plan (WFMP) has been developed for the CMAGR to assess the risks to natural resources and military training.

Objective: Conduct wildland fire management on the CMAGR.

Metric: Reduce wildfire potential, protect military assets, and protect and enhance natural resources.

Action 1: A WFMP that identifies regional fire attributes and guidance for managing wildfires, was completed in November 2018 and is currently being implemented. The WFMP development was a collaborative effort with local firefighting agencies, a fire ecologist, and the MCAS Yuma Conservation Program. It incorporated new and historical aerial photography of fuel loads, historic burns, vegetation recovery, and vegetation type (noting potential vulnerability of type conversion or invasion of nonnative vegetation).

4.13 Wildlife Watering Sources

Most wildlife species are able to survive by evading the hot and dry extremes of the Colorado Desert's climate through behavioral and physiological adaptations. Many species are adapted to survive without free water in their environment.

The CMAGR largely lacks surface waters for wildlife with the exception of ephemeral pools that develop after seasonal storms. The only water sources are from artificial tanks (guzzlers) and tinajas.

Objective: Provide and maintain an adequate water supply for wildlife on and transiting through the CMAGR.

Metric: Continue to support efforts to provide wildlife watering sources and maintain existing sources.

Action 1: Maintain access to the guzzlers along the Coachella Canal to allow native large mammals to move onto and off the CMAGR to use these guzzlers.

4.14 Ecosystem Management

The DoD recognizes the value of ecosystem management by establishing natural resource principles and guidelines for managers. Ecosystem management requires a shift from the management of single to multiple species and habitats. Since knowledge of the range's ecological system and funding is limited, resource management practices will be continuously reevaluated as new information becomes available. Flexibility and adaptation in the face of uncertainty are critical (Benton et al. 2008).

Objective: Implement an ecosystem approach to promote the conservation of native species and habitats, ensure sustainability and biological diversity, support the military's training mission, and compliance with applicable laws and regulations.

Metric: Acquire, develop, and maintain project and conservation information and GIS data relating to the physical environment and ecosystem management.

Action 1: Support research to gain the best available scientific information to guide natural resource and conservation decisions.

Action 2: Define and understand CMAGR's regional relevance and responsibility towards regional conservation efforts.

4.14.1 Aerial Orthophotography and Evaluation of Anthropogenic Impacts

Human activities can directly impact soils, vegetation, and local hydrology. Aerial photography and high-spatial-resolution satellite imagery can be used to monitor changes using repeated imagery acquisitions. With georeferenced imagery, surface disturbances (e.g., road widening, new spurs, vegetation damage, and damage to desert pavements) can be identified, quantified, and compared from one period to another. In 2009, MCAS Yuma contracted with a company to

collect aerial photography, in color and infrared, at 1-foot resolution. In 2015, MCAS Yuma acquired 1-foot-resolution, 4-band, direct-digital-stereo imagery.

Objective: Maintain aerial orthographic imagery.

Metric: Update aerial orthographic imagery at least once every five years.

Action 1: Establish current baseline and update aerial orthographic photographs over time to document landscape changes resulting from military activities and other land uses. This effort will allow the identification of well-managed and areas of concern resulting from the creation of new roads, military exercise, and erosion from overland flow.

Action 2: Utilize aerial orthographic imagery to conduct anthropogenic-impact-specific studies.

4.15 Soils

The Sikes Act and MCO 5090.2 – V11 (HQMC 2018) dictate the implementation of BMPs to control and prevent excessive soil erosion, implement soil conservation measures, and restore or rehabilitate degraded landscapes wherever practicable, subject to budgetary constraints. Adequate soil information is critical to determining those BMPs and implementing comprehensive environmental and natural resource monitoring.

Objective: Conserve soil resources by implementing effective BMPs to prevent soil erosion that may impede mission capacity or capability or adversely impact designated critical habitat or protected natural or cultural resources.

Metric: Conserve soil resources by mapping existing resources, preventing additional erosion where possible, and restoring eroded sites as practical.

Action 1: Develop spatial data related to soil associations and characteristics.

Action 2: Establish a soils and erosion monitoring framework to measure and assess changes over time (i.e., disturbance to soil, water runoff and flow regime, wind erosion and air quality). Remote-sensing methods, spatial-temporal models that are calibrated with ground measurements will be used to document changes in soil resources resulting from natural and human land use.

Action 3: Assess watershed erosion status and evaluate possible engineering solutions by 1) developing a GIS-based watershed model, 2) identifying areas of severe erosion, 3) installing erosion monitoring devices, and 4) evaluating erosion control alternatives.

4.16 Climate Change

The *Climate Adaptation for DoD Natural Resource Managers: A Guide to Incorporating Climate Considerations into Integrated Natural Resource Management Plans* provides guidance and metrics for climate adaptation. For the DoD, climate adaptation is defined as “adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects.” As such, adaptation

planning should be tailored to the mission, resources, and needs of the installation (Stein et al. 2019). Currently, baseline surveys are being conducted at more than 7,000 military installations and facilities worldwide to assess the effects of climate change and integrate these findings into military plans, operations, and training (DoD 2014).

DoD guidance encourages installations to adapt installation-specific conservation strategies by monitoring historical regional trends and climate or sea-level rise projections.

Objective: Develop and implement conservation strategies for adapting to global climate change as applicable laws and regulations.

Metric: Develop monitoring metrics and set targets to meet goals and objectives as they relate to the military mission and ecosystem management.

Action 1: Assess sustainability objectives and strategies in the context of climate change relevant to natural resources.

Action 2: Conduct vulnerability assessments of species and habitats most at risk in coordination with other DoD installations, CDFW, and USFWS.

Action 3: Collaborate with relevant partners to optimize the value of strategies developed for adaptation to climate change.

Action 4: Install and maintain weather stations, including rain gauges at specific study locations.

4.17 Cultural Resources

Marine Corps Base Yuma follows the guidelines of MCO P5090.2 – V11 dated 11 June 2018 with respect to the management of cultural resources. That document dictates that installations consult with federally recognized Native American tribes with interests that may be affected by INRMP preparation or revision. The Base will comply with the consultation procedures found in Chapter 8 of the document. The focus of this INRMP is on conserving, inventorying, and monitoring natural resources. However, if any projects occur as a result of guidance from this INRMP that are determined to be undertakings under Section 106 of the National Historic Preservation Act, formal consultation will be initiated on a case-by-case basis.

4.18 Conservation Program Geographic Information Services

The GIS program mission is to create, analyze, manage, and distribute authoritative standardized geospatial information, products, and services. A well-maintained and accessible GIS-based data also improve the likelihood of success for long-term planning.

Objective: Acquire, develop, and maintain spatial data for improved efficiency of natural resource management.

Metric: Support the military training exercises, improve natural resource management, and protect the environment while supporting the military mission.

Action 1: Continue the development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils.

4.19 Cooperative Initiatives

MCAS Yuma looks to internal stakeholders, cooperating agencies, and external stakeholders for specialist advice, BMPs, and natural resource management assessments, which has proven to be mutually beneficial.

Objective: Improve natural resource management strategies through effective communication with stakeholders and cooperating agencies.

Metric: Effective communication with stakeholders and cooperating agencies regarding resource management on the CMAGR.

Action 1: Cooperate with internal stakeholders (i.e., Environmental, Installations and Logistics, and Planning), cooperating agencies, and external stakeholders on natural resource management issues of mutual interest.

4.20 Recreation

Public safety and the protection of military missions are the principal reason no public access to the CMAGR is permitted. Public access is also restricted in the regions surrounding the range (e.g., BOR land), and there are no designated wilderness or wildlife areas within the range. The 2014 LEIS renewed the withdrawal of a major portion of the public land withdrawn under the CMLWOA, but reverted 2,589 acres to the BLM, realigning the CMAGR boundary with the Bradshaw Trail to improve public access to the trail.

4.21 Law Enforcement and Control of Public Access

The Commanding Officer of MCAS Yuma is responsible for land management, environmental compliance, security, training procedures, and safety on the CMAGR. The authorities available to the Commander in meeting these responsibilities include the Sikes Act, 16 U.S.C. 670; Assimilative Crimes Act, 18 U.S.C. 13; Uniformed Code of Military Justice, 10 U.S.C. 807B; and other applicable laws and regulations.

U.S. Conservation Law Enforcement Officers and Military Police are the tools the Commanding Officer uses to enforce these laws and regulations. Law enforcement personnel reduce the degradation of training facilities and ranges through enforcement and education of both authorized range users and the public. Areas of particular concern include trespassing, removal of materials, property damage, and poaching.

Objective 1: Provide law enforcement presence in the range training areas.

Objective 2: Protect natural and cultural resources from being exploited.

Objective 3: Reduce illegal trespass.

Metric: Maintenance of secure perimeter and provision of adequate law enforcement personnel.

Action 1: Establish and maintain adequate control measures (e.g., signs, gates, fences) to provide for security, safety, and protection of human, cultural, and natural resources.

4.22 Planned Projects and Implementation Schedule

This INRMP was developed in partnership with the USFWS and CDFW to include a five-year action plan (Appendix C). Actions are listed by program area and include priority classification, frequency, and regulatory requirements.

Projects are classified according to output or performance level standards established by the DoD that supports using a common framework of definitions, outputs, performance metrics, and cost drivers. These Common Output Level Standards (COLS) provide a description of the capability associated with the particular installation support function. COLS guidance is provided in DoDI 4001.01 with Change 1 (DoD 2011). Where appropriate, standards will be tiered to provide options for managing risk. COLS ratings are assigned to each planned project in accordance with guidance provided by DoDI 4001.01 with Change 1 (DoD 2011) and MCO 5090.2 – V11 (HQMC 2018).

COLS Level 1 – Low Risk (Full program health) – Program capability at COLS Level 1 provides minimized program and mission risk throughout the Future Years Defense Program (FYDP). It includes full compliance with mandated requirements and policies, protection of human health and personnel welfare, and sustained strategic management and planning activities to meet future year requirements and improve or enhance program capabilities; and it promotes sustainability opportunities and natural resource conservation.

COLS Level 2 – Medium Risk (Moderate program health) – Program capability at COLS Level 2 provides moderate program and mission risk throughout the FYDP. It includes minimal strategic management and planning activities that place the USMC at risk of being unprepared for future environmental requirements and threats to the mission. It funds only those policy requirements that are directly related to operational readiness and human health, leaving other BMPs unfunded. It does not include the ability to assess and implement program efficiencies or process improvements. In addition, it does not address initiatives to promote sustainability opportunities and natural resource conservation.

COLS Level 3 – High Risk (Low program health) – Program capability at COLS Level 3 provides high program and mission risk throughout the FYDP. It does not fund policy requirements that have a direct impact on operational readiness and human health. It does not fund all anticipated mandated emergent requirements based on historical execution, leaving full compliance subject to availability of discretionary funding through Current Year Deficiencies. It includes only strategic management and planning activities that are directly tied to explicitly mandated requirements by established deadlines, placing the installation at risk of being unprepared for future environmental requirements, threatening mission requirements. In addition, it does not fund policy requirements, including those that are directly related to operational readiness and human health and BMPs. It does not include the ability to assess and

implement program efficiencies or process improvements. Finally, it does not address initiatives to promote sustainability opportunities and natural resource conservation.

Implementation of this INRMP is subject to the availability of annual funding appropriated by Congress, and none of the proposed projects or actions shall be interpreted to require obligations or payment of funds in violation of any applicable federal law, including the Anti-Deficiency Act, 31 U.S.C. § 1341. The Installation requests project validation and funding through a variety of resources. MCAS Yuma intends to implement recommendations provided in this INRMP within the framework of regulatory compliance, national mission obligations, antiterrorism and force protection limitations, and funding constraints.

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5.0 REFERENCES

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PHOTOGRAPHY CREDITS**On Cover:****Top Row, Left to Right**

Burrowing owl (also Figure 3-16)

Desert tortoise (also Figure 3-7)

Second Row, Left to Right

Blue palo verde (top)

Munz's cholla (bottom)

Nelson's desert bighorn sheep (also Figure 3-8)

Third Row, Left to Right

Cooper's hawk (also Figure 3-12)

Bottom Row, Left to Right

Loggerhead shrike (also Figure 3-15)

Couch's spadefoot (also Figure 3-10)

Not on Cover:

American badger (Figure 3-9)

Golden eagle (Figure 3-11)

Vaux's swift (Figure 3-13)

Swainson's hawk (Figure 3-14)

Orocopia sage (Figure 3-17)

Fortuna Range suncup (Figure 3-18)

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Appendix A. General Flora and Fauna Found on the CMAGR

FORMAT PAGE

The following data sources documented species found on the Chocolate Mountain Aerial Gunnery Range (CMAGR) and inform Table A-1:

- Desert Tortoise Surveys for Special Warfare Training Areas 4 and 5 (Woodman 2008)
- Environmental Assessment for P-771 Proposed Infrastructure Improvements, Camp Billy Machen, California (U.S. Marine Corps 2012)
- Focused survey and habitat assessment for Agassiz's desert tortoise (*Gopherus agassizii*) on Special Warfare Training Area Ranges 4 and 5 of CMAGR in Riverside and Imperial counties, California (Circle Mountain Biological Consultants, Inc. 2013)
- Biological resources survey (Leidos 2014)
- Inventory of Small Mammals and Herpetofauna Within the Chocolate Mountains Aerial Gunnery Range, Riverside and Imperial Counties, California Annual Report (Gulf South Research Corporation 2021)

Table A-1. General Flora and Fauna Found on the CMAGR

Common Name	Scientific Name	Status
Reptiles		
California kingsnake	<i>Lampropeltis californiae</i>	
Coachwhip (red racer)	<i>Coluber flagellum piceus</i>	
Colorado Desert sidewinder	<i>Crotalus cerastes laterorepens</i>	
Common chuckwalla	<i>Sauromalus ater</i>	
Common side-blotched lizard	<i>Uta stansburiana</i>	
Desert horned lizard	<i>Phrynosoma platyrhinos</i>	
Desert iguana	<i>Dipsosaurus dorsalis</i>	
Desert night lizard	<i>Xantusia vigilis</i>	
Desert nightsnake	<i>Hypsiglena chlorophaea</i>	
Desert spiny lizard	<i>Sceloporus magister</i>	
Great Basin collared lizard	<i>Crotaphytus bicinctores</i>	
Great Basin gopher snake	<i>Pituophis catenifer deserticola</i>	
Great Basin tiger whiptail	<i>Aspidoscelis tigris tigris</i>	
Great Basin whiptail	<i>Aspidoscelis tigris</i>	
Long-nosed leopard lizard	<i>Gambelia wislizenii</i>	
Long-tailed brush lizard	<i>Urosaurus graciosus</i>	
Mojave desert tortoise	<i>Gopherus agassizii</i>	Federally and state threatened
Northern desert iguana	<i>Dipsosaurus dorsalis dorsalis</i>	
Red racer	<i>Coluber flagellum piceus</i>	
Sidewinder	<i>Crotalus cerastes</i>	
Sonoran gopher snake	<i>Pituophis catenifer affinis</i>	
Southern desert horned lizard	<i>Phrynosoma platyrhinos calidiarum</i>	
Southwestern speckled rattlesnake	<i>Crotalus mitchellii pyrrhus</i>	
Spiny softshell turtle*	<i>Apalone spiniferus</i>	Nonnative
Three-lined boa	<i>Lichanura orcutti</i>	
Western banded gecko	<i>Coleonyx variegatus</i>	

sp. – only identified to genus; **ssp.** – subspecies; **var.** – variety

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Status
Western diamondback rattlesnake	<i>Crotalus atrox</i>	
Western patch-nosed snake	<i>Salvadora hexalepis hexalepis</i>	
Western side-blotched lizard	<i>Uta stansburiana elegans</i>	
Western zebra-tailed lizard	<i>Callisaurus draconoides rhodostictus</i>	
Amphibians		
Red-spotted toad	<i>Anaxyrus punctatus</i>	
Rio Grande leopard frog	<i>Lithobates berlandieri</i>	
Birds		
American kestrel	<i>Falco sparverius</i>	Migratory Bird Treaty Act
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	Migratory Bird Treaty Act
Barn owl	<i>Tyto alba</i>	Migratory Bird Treaty Act
Barn swallow	<i>Hirundo rustica</i>	Migratory Bird Treaty Act
Black-chinned hummingbird	<i>Archilochus alexandri</i>	Migratory Bird Treaty Act
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>	Migratory Bird Treaty Act
Black-tailed gnatcatcher	<i>Poliophtila melanura</i>	California Watch List, Migratory Bird Treaty Act
Black-throated sparrow	<i>Amphispiza bilineata</i>	Migratory Bird Treaty Act
Blue-gray gnatcatcher	<i>Poliophtila caerulea</i>	Migratory Bird Treaty Act
Brewer's Sparrow	<i>Spizella breweri</i>	Bird of conservation concern, Migratory Bird Treaty Act
Burrowing Owl	<i>Athene cunicularia</i>	Bird of conservation concern, California species of special concern, Migratory Bird Treaty Act
Cactus wren	<i>Campylorhynchus brunneicapillus</i>	Migratory Bird Treaty Act
Chipping sparrow	<i>Spizella passerina</i>	Migratory Bird Treaty Act
Chukar	<i>Alectoris chukar</i>	Nonnative, game bird
Common poorwill	<i>Phalaenoptilus nuttallii</i>	Migratory Bird Treaty Act
Common raven	<i>Corvus corax</i>	Migratory Bird Treaty Act
Costa's hummingbird	<i>Calypte costae</i>	Bird of conservation concern, Migratory Bird Treaty Act
Eurasian collared-dove	<i>Streptopelia decaocto</i>	Nonnative
Gambel's quail	<i>Callipepla gambelii</i>	
Great horned owl	<i>Bubo virginianus</i>	Migratory Bird Treaty Act
Greater roadrunner	<i>Geococcyx californianus</i>	Migratory Bird Treaty Act
Great-tailed grackle	<i>Quiscalus mexicanus</i>	Migratory Bird Treaty Act
Hooded oriole	<i>Icterus cucullatus</i>	Migratory Bird Treaty Act
Horned lark	<i>Eremophila alpestris</i>	Migratory Bird Treaty Act
House finch	<i>Haemorhous mexicanus</i>	Migratory Bird Treaty Act
Lark sparrow	<i>Chondestes grammacus</i>	Migratory Bird Treaty Act
Lesser nighthawk	<i>Chordeiles acutipennis</i>	Migratory Bird Treaty Act
Mourning dove	<i>Zenaidura macroura</i>	Migratory Bird Treaty Act
Northern mockingbird	<i>Mimus polyglottos</i>	Migratory Bird Treaty Act

sp. – only identified to genus; **ssp.** – subspecies; **var.** – variety

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Status
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	Migratory Bird Treaty Act
Orange-crowned warbler	<i>Oreothlypis celata</i>	Migratory Bird Treaty Act
Phainopepla	<i>Phainopepla nitens</i>	Migratory Bird Treaty Act
Red-tailed hawk	<i>Buteo jamaicensis</i>	Migratory Bird Treaty Act
Rock wren	<i>Salpinctes obsoletus</i>	Migratory Bird Treaty Act
Ruby-crowned kinglet	<i>Regulus calendula</i>	Migratory Bird Treaty Act
Say's phoebe	<i>Sayornis saya</i>	Migratory Bird Treaty Act
Scott's oriole	<i>Icterus parisorum</i>	Bird of conservation concern, Migratory Bird Treaty Act
Townsend's warbler	<i>Setophaga townsendi</i>	Migratory Bird Treaty Act
Tree swallow	<i>Tachycineta bicolor</i>	Migratory Bird Treaty Act
Turkey vulture	<i>Cathartes aura</i>	Migratory Bird Treaty Act
Verdin	<i>Auriparus flaviceps</i>	Migratory Bird Treaty Act
Violet-green swallow	<i>Tachycineta thalassina</i>	Migratory Bird Treaty Act
Warbling vireo	<i>Vireo gilvus</i>	Migratory Bird Treaty Act
Western kingbird	<i>Tyrannus verticalis</i>	Migratory Bird Treaty Act
Western tanager	<i>Piranga ludoviciana</i>	Migratory Bird Treaty Act
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	Migratory Bird Treaty Act
White-throated swift	<i>Aeronautes saxatalis</i>	Migratory Bird Treaty Act
White-winged dove	<i>Zenaida asiatica</i>	Migratory Bird Treaty Act
Wilson's warbler	<i>Cardellina pusilla</i>	Migratory Bird Treaty Act
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	Bird of conservation concern, California species of special concern, Migratory Bird Treaty Act
Yellow-rumped warbler	<i>Setophaga coronata</i>	Migratory Bird Treaty Act
Mammals		
American badger	<i>Taxidea taxus</i>	California species of special concern
Audubon's cottontail	<i>Sylvilagus audubonii</i>	
Black-tailed jackrabbit	<i>Lepus californicus</i>	
Bobcat	<i>Lynx rufus</i>	
Botta's pocket gopher	<i>Thomomys bottae</i>	
Cactus mouse	<i>Peromyscus eremicus</i>	
Coyote	<i>Canis latrans</i>	
Desert cottontail	<i>Sylvilagus audubonii</i>	
Desert pocket mouse	<i>Chaetodipus penicillatus</i>	
Desert woodrat	<i>Neotoma lepida</i>	
Gray fox	<i>Urocyon cinereoargenteus</i>	
Kangaroo rat species	<i>Dipodomys</i> sp.	
Kit fox	<i>Vulpes macrotis</i>	
Long-tailed pocket mouse	<i>Chaetodipus formosus</i>	
Merriam's kangaroo rat	<i>Dipodomys merriami</i>	
Mule deer	<i>Odocoileus hemionus</i>	
Raccoon	<i>Procyon lotor</i>	

sp. – only identified to genus; **ssp.** – subspecies; **var.** – variety

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Status
Round-tailed ground squirrel	<i>Xerospermophilus tereticaudis</i>	
Spiny pocket mouse	<i>Chaetodipus spinatus</i>	
White-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>	
White-throated woodrat	<i>Neotoma albigula</i>	
White-tailed antelope ground squirrel	<i>Ammospermophilus leucurus</i>	
White-throated woodrat	<i>Neotoma albigula</i>	
Wild burro	<i>Equus astinus</i>	Nonnative, Wild Free-Roaming Horses and Burros Act
Plants		
Anderson's box-thorn	<i>Lycium andersonii</i>	
Barrel cactus	<i>Ferocactus cylindraceus</i>	
Bearded forget-me-not	<i>Cryptantha barbiger</i>	
Beavertail cactus	<i>Opuntia basilaris</i>	
Beetle spurge	<i>Euphorbia eriantha</i>	
Big galleta	<i>Hilaria rigida</i>	
Bladderpod	<i>Peritoma arborea</i>	
Blazing star	<i>Mentzelia</i> sp.	
Booth's evening primrose	<i>Eremothera boothii</i>	
Brittle spineflower	<i>Chorizanthe brevicornu</i>	
Brittlebush	<i>Encelia farinose</i>	
Brown-eyed primrose	<i>Chylismia claviformis</i>	
Burrobush	<i>Ambrosia dumosa</i>	
Bush seepweed	<i>Suaeda nigra</i>	
California fagonia	<i>Fagonia laevis</i>	
California tea	<i>Ephedra californica</i>	
California trixis	<i>Trixis californica</i>	
Catclaw acacia	<i>Senegalia greggii</i>	
Cheesebush	<i>Ambrosia salsola</i>	
Chia	<i>Salvia columbariae</i>	
Climbing milkweed	<i>Funastrum cynanchoides</i>	
Cooper's broomrape	<i>Aphyllon cooperi</i>	
Cottontop cactus	<i>Echinocactus polycephalus</i>	
Coyote gourd	<i>Cucurbita palmata</i>	
Creosote bush	<i>Larrea tridentata</i>	
Death Valley phacelia	<i>Phacelia vallis-mortae</i>	
Desert calico	<i>Loeseliastrum matthewsii</i>	
Desert chicory	<i>Rafinesquia neomexicana</i>	
Desert dandelion	<i>Malacothrix glabrata</i>	
Desert dicoria	<i>Dicoria canescens</i>	
Desert holly	<i>Atriplex hymenelytra</i>	

sp. – only identified to genus; **ssp.** – subspecies; **var.** – variety

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Status
Desert ironwood	<i>Olneya tesota</i>	
Desert lavender	<i>Hyptis emoryi</i>	
Desert mallow	<i>Sphaeralcea ambigua</i>	
Desert milk aster	<i>Stephanomeria pauciflora</i>	
Desert pincushion	<i>Chaenactis fremontii</i>	
Desert plantain	<i>Plantago ovata</i>	
Desert sand-verbena	<i>Abronia villosa</i>	
Desert starvine	<i>Brandegea bigelovii</i>	
Desert sunflower	<i>Geraea canescens</i>	
Desert tobacco	<i>Nicotiana obtusifolia</i>	
Desert trumpet	<i>Eriogonum inflatum</i>	
Desert willow	<i>Chilopsis linearis</i> ssp. <i>arcuata</i>	
Emory's rockdaisy	<i>Perityle emoryi</i>	
Fiddleneck	<i>Amsinckia tessellata</i>	
Fishhook cactus	<i>Mammillaria tetrancistra</i>	
Flat-topped buckwheat	<i>Eriogonum deflexum</i>	
Flix weed	<i>Descurainia sophia</i>	Nonnative, California Invasive Plant Council Limited
Four-winged saltbush	<i>Atriplex canescens</i>	
Giant blazing star	<i>Mentzelia laevicaulis</i>	
Grama	<i>Bouteloua</i> sp.	
Mojave Desert star	<i>Monoptilon bellioides</i>	
Green jointfir	<i>Ephedra viridis</i>	
Hairy prairie dalea	<i>Dalea mollis</i>	
Hedgehog cactus	<i>Echinocereus englemannii</i>	
Honey mesquite	<i>Prosopis glandulosa</i>	
Honeysweet	<i>Tidestromia oblongifolia</i>	
Jimsonweed	<i>Datura wrightii</i>	
Jojoba	<i>Simmondsia chinensis</i>	
Little trumpet	<i>Eriogonum trichopes</i>	
Low woollygrass	<i>Dasyochloa pulchella</i>	
Lupine species	<i>Lupinus</i> sp.	
Matchweed	<i>Gutierrezia sarothrae</i>	
Mesquite mistletoe	<i>Phoradendron californicum</i>	
Mexican bladder sage	<i>Scutellaria mexicana</i>	
Mojave ghost flower	<i>Mohavea confertifolia</i>	
Mojave prickly poppy	<i>Argemone corymbosa</i>	
Mojave rabbitbrush	<i>Ericameria paniculata</i>	
Mojave yucca	<i>Yucca schidigera</i>	
Narrowleaf ditaxis	<i>Ditaxis lanceolata</i>	
Narrowleaf sandpaper plant	<i>Petalonyx linearis</i>	California Native Plant Society 2B.3
Narrow-leaved forget-me-not	<i>Cryptantha angustifolia</i>	

sp. – only identified to genus; ssp. – subspecies; var. – variety

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Status
New Mexico ditaxis	<i>Ditaxis neomexicana</i>	
Ocotillo	<i>Fouquieria splendens</i>	
Odora	<i>Porophyllum gracile</i>	
Palo verde	<i>Parkinsonia floridum</i>	
Parish goldeneye	<i>Viguiera parishii</i>	
Parry's jujube	<i>Ziziphus parryi</i>	
Pebble pincushion	<i>Chaenactis carphoclinia</i>	
Pencil cholla	<i>Cylindropuntia ramosissima</i>	
Pickleweed	<i>Salicornia bigelovii</i>	
Pima ratany	<i>Krameria erecta</i>	
Puny buckwheat	<i>Eriogonum pusillum</i>	
Purplestem phacelia	<i>Phacelia crenulata</i> var. <i>ambigua</i>	
Purple rooted forget-me-not	<i>Cryptantha micrantha</i>	
Pygmy poppy	<i>Eschscholzia minutiflora</i>	
Rayless encelia	<i>Encelia frutescens</i>	
Red-stemmed filaree	<i>Erodium cicutarium</i>	Nonnative, California Invasive Plant Council Limited
Rigid chorizanthe	<i>Chorizanthe rigida</i>	
Rock hibiscus	<i>Hibiscus denudatus</i>	
Saharan mustard	<i>Brassica tournefortii</i>	Nonnative, California Invasive Plant Council High
Saltcedar	<i>Tamarix ramosissima</i>	Nonnative, California Invasive Plant Council High
Sandmat	<i>Euphorbia polycarpa</i>	
Sandpaper plant	<i>Petalonyx thurberi</i>	
Sapphire woollystar	<i>Eriastrum sapphirinum</i>	
Schott's indigo bush	<i>Psoralea schottii</i>	
Schott's pygmycedar	<i>Peucephyllum schottii</i>	
Silver cholla	<i>Cylindropuntia echinocarpa</i>	
Skeleton milkweed	<i>Asclepias subulata</i>	
Smoketree	<i>Psoralea spinosa</i>	
Spanish needle	<i>Palafoxia arida</i>	
Spiny senna	<i>Senna armata</i>	
Sweetbush	<i>Bebbia juncea</i>	
Tansy mustard	<i>Descurainia pinnata</i>	
Thick leaved ground cherry	<i>Physalis crassifolia</i>	
Purple three awn	<i>Aristida purpurea</i>	
Trailing windmills	<i>Allionia incarnata</i>	
Velvet rosette	<i>Psathyrotes ramosissima</i>	
White ratany	<i>Krameria grayi</i>	
Wing-nut cryptantha	<i>Cryptantha pterocarya</i>	
White-stemmed blazing star	<i>Mentzelia albicaulis</i>	

sp. – only identified to genus; **ssp.** – subspecies; **var.** – variety

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Status
Yellow cups	<i>Chylismia brevipes</i>	
Yellowdome	<i>Trichoptilium incisum</i>	

sp. – only identified to genus; **ssp.** – subspecies; **var.** – variety

* The spiny softshell turtle (*Apalone spiniferus*) record is that of a carcass transported by a predator, most likely from canals found off CMAGR. There is no spiny softshell turtle habitat found on CMAGR.

Appendix A References

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Appendix B. Other Special Status Species

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Table B-1. Other Special Status Species

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
				Present	Potential	
Reptiles						
Colorado Desert Fringe-Toed Lizard (<i>Uma notata</i>)	None	S	SSC		x	Occurs in open dune fields, washes, riverbanks, and shrub-invaded sand hummocks with at least sporadic, open patches of fine, unconsolidated or windblown sand (Stebbins 2003, Brennan and Holycross 2006).
Desert Tortoise (<i>Gopherus agassizii</i>)	T	None	T	X		Observed during herpetological surveys, adjacent to drift fence array 9 on 13 September 2020 (Gulf South Research Corporation 2021).
Mojave Fringe-Toed Lizard (<i>Uma scoparia</i>)	None	S	SSC		x	Occurs in low, windblown sandy washes and dunes associated with creosote scrub habitat. Habitat can be found on dune complexes, margins of dry lake beds and washes and in isolated pockets within hillsides (Stebbins 2003).
Amphibians						
Sonoran Desert Toad (<i>Incilius alvarius</i>)	None	None	SSC		x	Occurs in the irrigated lowlands of the extreme southeast portion of Imperial County. It can be found in a variety of desert and semiarid habitats: brushy desert with creosote bush and mesquite washes, semiarid grasslands, and woodlands. It is semiaquatic and is usually associated with large, somewhat permanent streams (Arnold 1943, Wright and Wright 1949, Behler and King 1979).
Birds						
Burrowing Owl (<i>Athene cunicularia</i>)	BCC, MBTA	S	SSC	x		Incidentally observed on Ted Kipf Road near Salvation Pass during nighttime surveys on 27 May 2020 (Gulf South Research Corporation 2021).

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Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
Crissal Thrasher (<i>Toxostoma crissale</i>)	MBTA	None	SSC	x		Uses a variety of vegetation communities but consistently inhabits tall, dense brush and shrub thickets in dry desert washes irrespective of the plant composition (Shuford and Gardali 2008). Individuals have been encountered in mountain chaparral and oak-piñon-juniper woodlands in parts of Arizona (Corman and Wise-Gervais 2005).
Ferruginous Hawk (<i>Buteo regalis</i>)	BCC, MBTA	None	SSC, WL	x		Overwinters in desert scrub and agricultural areas of the Imperial Valley (Shuford and Gardali 2008).
Gila Woodpecker (<i>Melanerpes uropygialis</i>)	BCC, MBTA	S	E		x	Occurs in low desert scrub with saguaro, palo verde, ironwood, or mesquite trees (Shuford and Gardali 2008). Also frequents riparian woodlands and dry desert washes with a high density of trees and treelike shrubs.
LeConte's Thrasher (<i>Toxostoma lecontei</i>)	BCC, MBTA	None	SSC (San Joaquin)	x		Inhabits sparse desert scrub habitats with few scattered trees or tall shrubs (Corman and Wise-Gervais 2005). It often nests in spiny shrubs or densely branched cactus. Uses scattered shrubs and cactus for cover, most frequently saltbush and cholla.
Lucy's Warbler (<i>Oreothlypis luciae</i>)	BCC, MBTA	S	SSC	x		Occurs in riparian mesquite woodlands (Johnson et al. 1997).
Merlin (<i>Falco columbarius</i>)	MBTA	None	WL		x	Occurs in grasslands, shrub lands, woodlands, and agricultural areas with suitable perch sites (Ferguson-Lees 2001).
Northern Harrier (<i>Circus hudsonius</i>)	MBTA	None	SSC	x		Prefers open habitats with lookout perches such as shrubs or fence posts. These habitats include weedy borders of rivers, lakes, streams, freshwater marshes, grasslands, weed fields, pastures, and some croplands i.e., alfalfa and melons) (Ferguson-Lees 2001).

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Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
Peregrine Falcon (<i>Falco peregrinus</i>)	MBTA	None	None		x	Occurs in areas with rocky, steep cliffs, primarily near water, where prey (shorebirds, songbirds, and waterfowl) concentrations are high. Nests are found on ledges of cliffs and sometimes on human-made structures such as office towers and bridge abutments (USFWS 2001).
Prairie Falcon (<i>Falco mexicanus</i>)	BCC, MBTA	None	WL	x		Found in areas where cliffs provide secure nesting sites (Shuford and Gardali 2008). This species occurs in all vegetation types in the desert, although sparse vegetation provides the best foraging habitat (Shuford and Gardali 2008). Predominantly a winter resident in the Colorado Desert (Shuford and Gardali 2008).
Mammals						
Big Free-Tailed Bat (<i>Nyctinomops macrotis</i>)	None	None	SSC	x		Primarily inhabits rugged, mountainous terrain in desert and semidesert habitats. Occurs in desert scrub, woodlands, and evergreen forests and roosts in rock crevices where cliffs occur and occasionally roosts in buildings, caves, and tree cavities (Adams 2003).
California Leaf-Nosed Bat (<i>Macrotus californicus</i>)	None	S	SSC	x		Mating, maternity, and overwintering roosts are in caves or mines that provide a warm temperature of about 80°F (Adams 2003). Forages almost exclusively along dry desert washes within about 6 miles of the roost site (Adams 2003).
Pallid Bat (<i>Antrozous pallidus</i>)	None	S	SSC	x		Occurs in desert scrub, piñon-juniper woodlands, and transition forest habitats. Roosts in small colonies of up to 20 individuals in rock crevices, buildings, and other built structures (Adams 2003) and occasionally in caves, mines, rock piles, and tree cavities.

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Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
Pocketed Free-Tailed Bat (<i>Nyctinomops femorosaccus</i>)	None	None	SSC	x		Occurs in a variety of plant communities from desert scrub through pine-oak forests, but the species is most common in desert and semidesert environments. In California, found primarily in creosote bush and chaparral habitats in or near granite boulders, cliffs, or rocky canyons and roosts primarily in crevices of rugged cliffs, high rocky outcrops, and slopes (Adams 2003).
Townsend's Big-Eared Bat (<i>Corynorhinus townsendii</i>)	None	S	SSC		x	Occurs primarily in rural settings from the inland deserts to the cool, moist coastal redwood forests, in oak woodlands of the inner coast ranges and Sierra Nevada foothills, and lower to mid-elevation mixed coniferous-deciduous forests. Its distribution, however, tends to be geomorphically determined and is strongly correlated with the availability of caves or cavelike roosting habitat (SSC list).
Western Mastiff Bat (<i>Eumops perotis californicus</i>)	None	S	SSC	x		Most common in areas with desert scrub and broad open expanses. Foraging habitat includes dry desert washes, floodplains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas (Adams 2003). Primarily a cliff-dwelling species that roosts in rock crevices, under exfoliating slabs of rock, in shallow cliffside caves, and in buildings (Adams 2003).
Western Small-Footed Myotis (<i>Myotis ciliolabrum</i>)	None	S	None	x		Occurs in deserts, chaparral, riparian zones, and western coniferous forests; it is most common above the piñon-juniper woodland zone. Individuals are known to roost singly or in small groups in cliff and rock crevices, buildings, concrete overpasses, caves, and mines (Adams 2003).
Western Yellow Bat (<i>Lasiurus xanthinus</i>)	None	None	SSC	x		Occurs in desert and semidesert habitats of the southwestern U.S. Commonly roosts beneath dead palm fronds in both native and nonnative palm trees, in cottonwoods in riparian gallery forests and woodlands, and in treelike yuccas (Adams 2003).

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Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat	Habitat Association
Plants					
Algodones Dunes Sunflower (<i>Helianthus niveus</i> ssp. <i>tephrodes</i>)	None	S	E, CRPR 1B.2	x	Occurs in the Algodones Dunes in dune environments with fine sands and a cover of creosote bush desert scrub (CNPS 2015, SEINet 2011).
California Ayenia (<i>Ayenia compacta</i>)	None	None	CRPR 2B.3, SH S3?1 ¹	x	Occurs on bajadas and rocky slopes (CNPS 2015, SEINet 2011).
Cove's Cassia (<i>Senna covesii</i>)	None	None	CRPR 2B.2, SH S1	x	Grows in Sonoran desert scrub or near dry desert washes or slopes with sandy soil (CNPS 2015, SEINet 2011).
Slender-Spined All Thorn (<i>Koeberlinia spinosa</i> var. <i>tenuispina</i>)	None	None	CRPR 2B.2, SH S2.2	x	Occurs in the Colorado Desert on rocky or gravelly soils in washes and ravines within Sonoran desert scrub and within dry desert wash woodland dominated by blue palo verde, ironwood, and smoketree (CNPS 2015, SEINet 2011).
Darlington's Blazing Star (<i>Mentzelia puberula</i>)	None	None	CRPR 2B.2, SH S2	x	Grows commonly on rock outcrops and talus along canyon walls in creosote bush desert scrub, primarily in the Mojave Desert (CNPS 2015, SEINet 2011).
Glandular Ditaxis (<i>Ditaxis claryana</i>)	None	None	CRPR 2B.2, SH S1	x	Grows on sandy substrates in Sonoran and Mojave desert scrub, often near dry washes and on bajadas (CNPS 2015, SEINet 2011).

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Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
Desert Spike Moss (<i>Selaginella eremophila</i>)	None	None	CRPR 2B.2, SH S2S3		x	Desert scrub, rocky habitats (CNPS 2015).
Emory's Crucifixion-Thorn (<i>Castela emoryi</i>)	None	None	CRPR 2B.2, SH S2S3		x	Occurs on sandy to gravelly substrates on bajadas and in dry washes (CNPS 2015, SEINet 2011).
Giant Spanish Needle (<i>Palafoxia arida</i> var. <i>gigantea</i>)	None	S	CRPR 1B.3, SH S2		x	Grows in Colorado Sonoran desert scrub and desert dunes with deep, fine, sandy soils (CNPS 2015, SEINet 2011).
Harwood's Rattleweed (<i>Astragalus insularis</i> var. <i>harwoodii</i>)	None	None	CRPR 2B.2, SH S2.2		x	Occurs in Sonoran desert scrub in dunes and other areas with a sandy substrate (CNPS 2015, SEINet 2011).
Las Animas Colubrine (<i>Colubrina californica</i>)	None	None	CRPR 2B.3, SH S2S3.3	x		Occurs along washes and dry slopes with coarse substrates (CNPS 2015, SEINet 2011).
Munz's Cholla (<i>Cylindropuntia munzii</i>)	None	S	CRPR 1B.3, SH S1.2	x		Grows in Sonoran desert scrub on sandy to gravelly substrates along washes and canyon walls (CNPS 2015, SEINet 2011).
Peirson's Milk-Vetch (<i>Astragalus magdalenae</i> var. <i>peirsonii</i>)	T	None	E, CRPR 1B.2, SH S1		x	Occurrence limited to the Algodones Dunes and Gran Desierto. (CNPS 2015, SEINet 2011). Designated critical habitat for the species occurs in the Algodones Dunes from State Route 78 to approximately Mammoth Wash.
Pink Fairy-Duster (<i>Calliandra eriophylla</i>)	None	None	CRPR 2B.3, SH S3		x	Occurs on sandy, rocky soils in washes, gullies, and mesas and in dry desert wash woodlands with blue palo verde, ironwood, and smoketree (CNPS 2015, SEINet 2011).

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Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
Sand Food (<i>Pholisma sonorae</i>)	None	S	CRPR 1B.2, SH S2		x	Occurrence restricted to the Algodones Dunes and deep sands in the Imperial Valley in California, as well as dunes in southwestern Yuma County, Arizona, and northwestern Sonora, Mexico (CNPS 2015, SEINet 2011).
Slender Cottonheads (<i>Nemacaulis denudata</i> var. <i>gracilis</i>)	None	None	CRPR 2B.2, SH S2		x	Grows in sand dunes and deep sandy soil and associates with sparse desert scrub and coastal strand plant communities (CNPS 2015, SEINet 2011).
Spear-Leaf Matelea (<i>Matelea parvifolia</i>)	None	None	CRPR 2B.3, SH S3	x		Occurs in Sonoran and Mojave deserts on gravelly, rocky soils in hills and mountains in desert scrub plant communities and associates with creosote bush (CNPS 2015, SEINet 2011).
Triple-Ribbed Milk-vetch (<i>Astragalus tricarlinatus</i>)	E	None	CRPR 1B.2, SH S2		x	Occurs on rocky, exposed slopes, ridges, and rockslides in upland areas with a decomposed granite substrate (Amsberry and Meinke 2007).
Wiggins' Croton (<i>Croton wigginsii</i>)	None	S	CRPR 2B.2, SR, SH S2, RCNPPA		x	Grows in the Colorado Desert within Sonoran desert scrub on fine sandy soils of dunes and sand fields in the Algodones Dunes (CNPS 2015, SEINet 2011).

BLM – Bureau of Land Management; **MBTA** – Migratory Bird Treaty Act; **USFWS** – United States Fish and Wildlife Service; **°F** – degrees Fahrenheit; **CRPR** – California Rare Plant Rank; **CNPS** – California Native Plant Society; **SEINet** – Southwest Environmental Information Network; **RCNPPA** – Rare California Native Plant Protection Act

Federal Status: Endangered Species Act of 1973: T = Threatened, E = Endangered, CA = Candidate U.S. Fish and Wildlife Service: BCC = Bird of Conservation Concern, MBTA = Migratory Bird Treaty Act

Bureau of Land Management (BLM) Status: S = Sensitive

State Status: California Department of Fish and Wildlife: SSC = Species of Special Concern, FP = Fully Protected. Fully protected species may not be taken or possessed at any time, and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock, T = Threatened, E = Endangered, WL = Watch List

California Native Plant Society Rankings:

CRPR 1B.2: 1 = rare, threatened, or endangered in California and elsewhere; 2 = fairly threatened in California (20%-80% of occurrences threatened/moderate degree and immediacy of threat)

CRPR 1B.3: 1 = rare, threatened, or endangered in California and elsewhere; 3 = not very threatened in California (less than 20% of occurrences threatened/low

degree and immediacy of threat or no current threats known)

CRPR 2B.2: 2 = rare, threatened, or endangered in California but common elsewhere; 2 = fairly threatened in California (20%-80% of occurrences threatened/moderate degree and immediacy of threat)

CRPR 2B.3: 2 = rare, threatened, or endangered in California but common elsewhere; 3 = not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

California State Heritage Rankings:

SH S2.2: S2 = imperiled; 2 = fairly endangered in California (20%-80% of occurrences threatened)

SH S1.2: S1 = critically Imperiled; 2 = fairly endangered in California (20%-80% of occurrences threatened)

SH S3: S3 = vulnerable

SH S2S3: S2 = imperiled; S3 = vulnerable

SH S2S3.3: S2= imperiled; S3 = vulnerable; .3 = not very endangered in California (less than 20% of occurrences threatened)

¹ Adding an “?” to the rank represents more certainty than S3S4 (in the range of vulnerable to apparently secure), but less certainty than S3 (vulnerable).

Table B-1 References

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Appendix C. CMAGR INRMP 5-Year Action Plan: FY23-28

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Table C-1. CMAGR INRMP 5-Year Action Plan: FY23-28

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
INRMP Implementation	4.1-1: Prioritize, pursue funding opportunities, and implement projects as outlined in this updated INRMP.	23-28	3	Annual	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.1-2: Review the INRMP annually for Operation and Effect.	23-28	3	Annual	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
NEPA Review	4.2-1: Provide expert review of potential impacts of federal actions on the CMAGR.	23-28	3	Ongoing	NEPA of 1969 (42 U.S.C. 4321–4370h; 40 CFR Parts 1500–1508), DoDI 4715.03 and MCO P5090.2A w/changes 1-3
ESA Compliance	4.3-1: Adhere to conservation measures and relevant avoidance measures identified in all applicable USFWS BOs (see Appendix E for all applicable BOs).	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.3-2: Manage federally listed threatened or endangered species and their habitats to prevent jeopardy to the species and to assist in their conservation and recovery.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.3-3: Manage federally listed threatened or endangered species and their habitats in a manner that minimizes impacts to both mission and species.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.3-4: Proactively collect information on presence or absence, location, habitat availability and suitability, and life history requirements of federally listed threatened or endangered species and maintain and update these data.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO P5090.2A w/changes 1-3

FY – fiscal year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **U.S.C.** – United States Code; **DoDI** – DoD Instruction; **MCO** - Marine Corps Order; **NEPA** – National Environmental Policy Act; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **CFR** – Code of Federal Regulations; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **GIS** – geographic information system; **FWCA** - Fish and Wildlife Conservation Act; **MBTA** – Migratory Bird Treaty Act; **BGEPA** – Bald and Golden Eagle Protection Act; **EO** - Executive Order; **BASH** – Bird/Animal Aircraft Strike Hazard; **StaO** – Station Order; **MCAS** – Marine Corps Air Station; **BLM** – Bureau of Land Management; **DoD** – Department of Defense

Table C-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.3-5: Develop and maintain a robust GIS database that will be updated as survey data become available, to document spatial and temporal distribution of federally listed threatened or endangered species.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO 11000.25, Installation Geospatial Information and Services
Threatened or Endangered Species, Critical Habitat	4.4-1: Continue participation in annual desert tortoise surveys in support of inventory, monitoring, and mapping efforts.	23-28	3	Annual	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.4-2: Map desert tortoise population, densities, habitat parameters, and threats across the range.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.4-3: Continue to participate in the Desert Tortoise Management Oversight Group and the California Recovery Implementation Team. Develop project proposals to assist with the species recovery.	23-28	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.4-4: Pending decisions of other state and federal lead agencies, determine whether the reintroduction of a nonessential experimental population of Sonoran pronghorn will be compatible with training mission objectives and designed to avoid conflicting with range operations.	23	2	One-time	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.4-5: Assist in coordination and provide in-kind and financial support, if available, to the Sonoran pronghorn recovery team.	23-28	2	Varies	ESA of 1973, as amended (16 U.S.C. 1531, <i>et seq.</i>), DoDI 4715.03, and MCO P5090.2A w/changes 1-3

FY – fiscal year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **U.S.C.** – United States Code; **DoDI** – DoD Instruction; **MCO** - Marine Corps Order; **NEPA** – National Environmental Policy Act; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **CFR** – Code of Federal Regulations; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **GIS** – geographic information system; **FWCA** - Fish and Wildlife Conservation Act; **MBTA** – Migratory Bird Treaty Act; **BGEPA** – Bald and Golden Eagle Protection Act; **EO** - Executive Order; **BASH** – Bird/Animal Aircraft Strike Hazard; **StoO** – Station Order; **MCAS** – Marine Corps Air Station; **BLM** – Bureau of Land Management; **DoD** – Department of Defense

Table C-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
Other Special Status Species	4.5-1: Inventory and monitor special status species to establish a baseline from which conservation and management strategies can be devised.	23-28	2	Ongoing	FWCA of 1980 (16 U.S.C. 2901 <i>et seq.</i>), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Migratory Birds and Eagles	4.6-1: Avoid or minimize impacts to migratory birds and eagles and their habitat.	23-28	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.6-2: Conduct presence/absence surveys periodically as part of an adaptive management strategy to better inform migratory bird management on the range.	23-28	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.6-3: Develop, implement, and evaluate conservation measures for management actions to avoid or minimize incidental take of migratory birds and eagles.	23-28	2	One-time	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.6-4: Participate in regional or national inventory and monitoring programs.	23-28	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3

FY – fiscal year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **U.S.C.** – United States Code; **DoDI** – DoD Instruction; **MCO** - Marine Corps Order; **NEPA** – National Environmental Policy Act; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **CFR** – Code of Federal Regulations; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **GIS** – geographic information system; **FWCA** - Fish and Wildlife Conservation Act; **MBTA** – Migratory Bird Treaty Act; **BGEPA** – Bald and Golden Eagle Protection Act; **EO** - Executive Order; **BASH** – Bird/Animal Aircraft Strike Hazard; **StaO** – Station Order; **MCAS** – Marine Corps Air Station; **BLM** – Bureau of Land Management; **DoD** – Department of Defense

Table C-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
BASH Program	4.7-1: Maintain the existing MBTA depredation permit(s).	23-28	3	Annual	MBTA of 1918, MCO P5090.2A w/changes 1-3, and MCAS Yuma StaO 3750.1B
	4.7-2: Update as necessary and periodically evaluate possible improvements to this successful program that might further reduce BASH incidents.	23-28	3	Varies	MCO P5090.2A w/changes 1-3 and MCAS Yuma StaO 3750.1B
General Wildlife	4.8-1: Inventory and monitor distribution and abundance of reptiles, birds, amphibians, and small mammals.	23-28	2	Ongoing	FWCA of 1980 (16 U.S.C. 2901 <i>et seq.</i>), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.8-2: Maintain vegetation known to support wildlife.	23-28	2	Ongoing	DoDI 4715.03 and MCO P5090.2A w/changes 1-3
	4.8-3: Restore or enhance vegetation outside of heavy-use areas.	23-28	2	Ongoing	DoDI 4715.03 and MCO P5090.2A w/changes 1-3
Nonnative and Nuisance Wildlife	4.9-1: Work in partnership with the BLM to control the wild burro populations.	23-28	2	Ongoing	DoDI 4715.03, MCO P5090.2A w/changes 1-3, EO 11987 Exotic Organisms and EO 13112 Invasive Species
	4.9-2: Inventory, monitor and control raven populations.	23-28	2	Ongoing	DoDI 4715.03, MCO P5090.2A w/changes 1-3, EO 11987 Exotic Organisms and EO 13112 Invasive Species

FY – fiscal year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **U.S.C.** – United States Code; **DoDI** – DoD Instruction; **MCO** - Marine Corps Order; **NEPA** – National Environmental Policy Act; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **CFR** – Code of Federal Regulations; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **GIS** – geographic information system; **FWCA** - Fish and Wildlife Conservation Act; **MBTA** – Migratory Bird Treaty Act; **BGEPA** – Bald and Golden Eagle Protection Act; **EO** - Executive Order; **BASH** – Bird/Animal Aircraft Strike Hazard; **StaO** – Station Order; **MCAS** – Marine Corps Air Station; **BLM** – Bureau of Land Management; **DoD** – Department of Defense

Table C-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.9-3: Develop pest species management programs as needed to include pest mammals such as rabbits, skunks, raccoon, squirrels, coyotes, feral dogs, feral cats, and pest birds.	23-28	2	Ongoing	DoDI 4715.03, DoDI 4150.07, MCO P5090.2A w/changes 1-3, EO 11987 Exotic Organisms and EO 13112 Invasive Species
Vegetation	4.10-1: Complete vegetation mapping.	23-28	2	Ongoing	DoDI 4715.03, MCO P5090.2A w/changes 1-3, and MCO 11000.25, Installation Geospatial Information and Services
	4.10-2: Identify essential habitats for rare plants and wildlife.	23-28	2	Varies	DoDI 4715.03 and MCO P5090.2A w/changes 1-3,
Invasive and Nonnative Plant Species	4.11-1: Acquire reliable baseline data on the presence and abundance of invasive and nonnative plant species.	23-28	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 <i>et seq.</i>); DoDI 4715.03; DoDI 4150.07; MCO P5090.2A w/changes 1-3; EO 11987 Exotic Organisms; and EO 13112 Invasive Species
	4.11-2: Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness.	23-28	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 <i>et seq.</i>); DoDI 4715.03; DoDI 4150.07; MCO P5090.2A w/changes 1-3; EO 11987 Exotic Organisms; and EO 13112 Invasive Species
	4.11-3: Treat and monitor areas most likely to impact ecosystem health or mission readiness.	23-28	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 <i>et seq.</i>); DoDI 4715.03; DoDI 4150.07; MCO P5090.2A w/changes 1-3; EO 11987 Exotic Organisms; and EO 13112 Invasive Species

FY – fiscal year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **U.S.C.** – United States Code; **DoDI** – DoD Instruction; **MCO** - Marine Corps Order; **NEPA** – National Environmental Policy Act; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **CFR** – Code of Federal Regulations; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **GIS** – geographic information system; **FWCA** - Fish and Wildlife Conservation Act; **MBTA** – Migratory Bird Treaty Act; **BGEPA** – Bald and Golden Eagle Protection Act; **EO** - Executive Order; **BASH** – Bird/Animal Aircraft Strike Hazard; **StoO** – Station Order; **MCAS** – Marine Corps Air Station; **BLM** – Bureau of Land Management; **DoD** – Department of Defense

Table C-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
Wildland Fire Management	4.12-1: Implement the Wildland Fire Management Plan.	23-28	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, DoDI 6055.06, and MCO 5090.2A
Wildlife Watering Sources	4.13-1: Maintain access to the guzzlers along the Coachella Canal to allow large mammals to move onto and off the CMAGR to use these guzzlers.	23-28	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Ecosystem Management	4.14-1: Support research to gain the best available scientific information to guide natural resource and conservation decisions.	23-28	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.14-2: Define and understand CMAGR's regional relevance and responsibility towards regional conservation efforts.	23-28	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.14-3: Update aerial orthographic photographs over time to determine a baseline and to document landscape changes.	25	2	Once per 5 years	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.14-4: Utilize aerial orthographic imagery to conduct anthropogenic-impact-specific studies.	26	2	Once per 5 years	MCO P5090.2A w/changes 1-3, MCO 11000.25 Installation Geospatial Information and Services
Soils	4.15-1: Establish a soils and erosion monitoring framework to measure and assess changes to soil resources over time.	23-28	2	Ongoing	Soil Conservation Act (16 U.S.C. 590a <i>et seq.</i>), DoDI 4715.03, and MCO P5090.2A w/changes 1-3

FY – fiscal year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **U.S.C.** – United States Code; **DoDI** – DoD Instruction; **MCO** - Marine Corps Order; **NEPA** – National Environmental Policy Act; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **CFR** – Code of Federal Regulations; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **GIS** – geographic information system; **FWCA** - Fish and Wildlife Conservation Act; **MBTA** – Migratory Bird Treaty Act; **BGEPA** – Bald and Golden Eagle Protection Act; **EO** - Executive Order; **BASH** – Bird/Animal Aircraft Strike Hazard; **StaO** – Station Order; **MCAS** – Marine Corps Air Station; **BLM** – Bureau of Land Management; **DoD** – Department of Defense

Table C-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.15-2: Assess current erosion status within the watershed and evaluate possible engineering management practices that will mitigate erosion.	23-28	2	Ongoing	Soil Conservation Act (16 U.S.C. 590a <i>et seq.</i>), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.15-3: Develop spatial data related to soil associations and characteristics.	23-28	2	Ongoing	Soil Conservation Act (16 U.S.C. 590a <i>et seq.</i>), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Climate Change	4.16-1: Conduct an assessment of sustainability objectives and strategies in the context of climate change relevant to natural resources on the CMAGR.	23-28	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
	4.16-2: Conduct vulnerability assessments of species and habitats most at risk, coordinating with other DoD installations for guidance.	23-28	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
	4.16-3: Collaborate with DoD mission leads, wildlife agencies, and other relevant partners to optimize the value of strategies developed for adaptation to climate change.	23-28	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
	4.16-4: Install and maintain weather stations, including rain gauges at specific study locations.	23-28	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap

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Table C-1. CMAGR INRMP 5-Year Action Plan: FY23-28 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
Conservation Program GIS	4.18-1: Continue development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils.	23-28	2	Ongoing	DoDI 4715.03 and MCO 11000.25 Installation Geospatial Information and Services
Cooperative Initiatives	4.19-1: Cooperate with internal stakeholders (i.e., Environmental, Installations and Logistics, and Planning), cooperating agencies, and external stakeholders on natural resource management issues of mutual interest.	23-28	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Law Enforcement	4.21-1: Establish and maintain adequate control measures (signs, gates, fences, etc.) to provide for security, safety, and protection of natural resources.	23-28	3	Ongoing	Sikes Act (16 U.S.C. 670), Assimilative Crimes Act (18 U.S.C. 13), Uniformed Code Of Military Justice (10 U.S.C. 807B)

FY – fiscal year; **COLS** – Common Output Level Standards; **INRMP** – Integrated Natural Resources Management Plan; **U.S.C.** – United States Code; **DoDI** – DoD Instruction; **MCO** - Marine Corps Order; **NEPA** – National Environmental Policy Act; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **CFR** – Code of Federal Regulations; **ESA** – Endangered Species Act; **USFWS** – U.S. Fish and Wildlife Service; **BO** – Biological Opinion; **GIS** – geographic information system; **FWCA** - Fish and Wildlife Conservation Act; **MBTA** – Migratory Bird Treaty Act; **BGEPA** – Bald and Golden Eagle Protection Act; **EO** - Executive Order; **BASH** – Bird/Animal Aircraft Strike Hazard; **StoO** – Station Order; **MCAS** – Marine Corps Air Station; **BLM** – Bureau of Land Management; **DoD** – Department of Defense

Appendix D. Results of Annual Review

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Appendix E. Biological Opinions for Species on the CMAGR

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United States Department of the Interior



FISH AND WILDLIFE SERVICE

Ecological Services

Palm Springs Fish and Wildlife Office
777 East Tahquitz Canyon Way, Suite 208
Palm Springs, California 92262

In Reply Refer To:
FWS-IMP-15B0239-16F0039

NOV 9 2015

William Sellars
Range Management Director
United States Marine Corps
Marine Corps Air Station Yuma
Box 99100
Yuma, Arizona 85369-9100

Subject: Proposed SWATs 4 and 5 – Amendment to Biological Opinion 1-6-95-F-40 for Military Use of the Chocolate Mountain Aerial Gunnery Range, Imperial and Riverside Counties, California

Dear Mr. Sellars:

This letter constitutes an amendment to the April 18, 1996, Biological Opinion for Military Use of the Chocolate Mountain Aerial Gunnery Range (File No. 1-6-95-F-40) in Imperial and Riverside counties. The United States Marine Corps (USMC) proposes to reconfigure existing range and training areas (RTAs), improve range infrastructure, and increase the annual throughput of personnel and number of training events within Special Warfare Training Areas (SWAT) 4 and 5. The U.S. Fish and Wildlife Service (Service) received your electronic request for formal consultation on June 3, 2015, at which time formal consultation was initiated. This amendment adds the proposed action to that which was analyzed under the original biological opinion (Service 1996), and incorporates by reference the analysis contained in the recent amendment for the Target Complex Invader (Service 2015), which included a more thorough analysis of military operations on the federally threatened Mojave desert tortoise (*Gopherus agassizii*, desert tortoise) and its designated critical habitat in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*).

This amendment is based on information provided in the following documents: (1) *Final Biological Assessment for the Proposed Range Redesign of Special Warfare Training Areas 4 and 5, Chocolate Mountains Aerial Gunnery Range, Imperial and Riverside Counties*, dated May 2015 (U.S. Department of the Navy and USMC 2015); (2) the amendment to the original biological opinion for the Proposed Target Complex Invader (Service 2015); (3) various communications between the MCASY and the Service; and (4) other information available in our files.

Under the proposed action, changes to SWATs 4 and 5 would include:

1. Reconfiguration and re-construction of the static ranges;

2. Increase the amount of area available for live fire and maneuver (LFAM) training within the existing SWATs 4 and 5 boundaries;
3. Increase the size and number of target areas within the existing SWATs 4 and 5 boundaries;
4. Construction of new access roads and the improvement of a portion of the existing access road network;
5. Establish mounted and dismounted LFAM ranges;
6. Authorize off-road driving and maneuvering by tactical vehicles in certain areas; and
7. Authorize MV-22s to land anywhere that legacy rotary-wing aircraft can operate.

The reconfiguration would result in 11 fixed LFAM ranges (i.e., 7 dismounted and 4 mounted/dismounted), 14 LFAM target areas, 13 static ranges, and 1 high hazard impact area (HHIA). The total footprints of these features are summarized in Table 1. These operational and infrastructure optimizations would include modifications to the existing range and training areas (RTAs), and certification of additional RTAs, and other improvements. Additionally, off-road vehicle driving and maneuvering by tactical vehicles would be authorized within SWATs 4 and 5 [subject to conservation measures (CM) identified below] and dismounted (foot) movements would continue to be authorized in all of SWATs 4 and 5. All firing points would be located within SWATs 4 and 5; there would be no change to the SWATs 4 and 5 boundaries under the proposed action. The proposed HHIA and associated surface danger zones would extend from the eastern boundary of SWAT 4 into the adjacent portion of the CMAGR in R-2507N; no surface disturbance will occur within R-2507N.

**Table 1. Summary of Proposed Project Feature Footprints within
Special Warfare Training Areas 4 and 5**

Feature	Proposed Action	No-Action Alternative (Existing Features)
SWAT 4	23,444 acres	23,444 acres
SWAT 5	8,444 acres	8,444 acres
Roads (including Access Roads)	194 acres	171 acres
Static Ranges	912 acres	1,721 acres
Rotary-wing Landing Zone	265 acres	265 acres
HHIA	2,882 acres	1,753 acres
Inactive Range	0	476 acres
LFAM Mounted Range	1,926 acres	N/A
LFAM Dismounted Range	5,876 acres	N/A
LFAM Mounted Area	20,892 acres	N/A
LFAM Dismounted Area	4,021 acres	N/A
Target Area	848 acres	N/A

Notes: Several existing features overlap one another; therefore, the sum of the existing features is greater than the total action area. The same is also true for the proposed features. N/A = not applicable.

Approximately 188,000 acres of desert tortoise critical habitat are designated in the northeastern half of the CMAGR as part of the Chuckwalla DWMA (Service 1994), of which approximately 4,320 acres occur in SWAT 5. Given the importance of critical habitat to the species, areas of overlapping critical habitat and project footprints were minimized under the proposed action.

Areas with slope greater than 30 degrees are too steep for equipment and vehicles. Therefore, all areas of slope greater than 30 degrees were excluded for mounted (i.e., vehicle) use and helicopter landings; however, these areas would continue to be available for dismounted (foot) activity under the proposed action.

Range S-5-3, at 370 acres, is the only proposed LFAM range located within desert tortoise critical habitat; other than using the Bradshaw Trail to access S-5-3 itself, no mounted movement is proposed within the balance of desert tortoise critical habitat located in SWAT 5. The remaining areas of SWAT 5 located within desert tortoise critical habitat would continue to be available for dismounted movement, including foot-mobile LFAM and tactical helicopter landings. No MV-22 landings would occur within desert tortoise critical habitat.

Conservation Measures

The proposed action would include the measures below to minimize potential effects on biological resources, particularly the desert tortoise. These measures are based upon review of potential project effects and the incorporation of applicable terms and conditions from previous consultations addressing similar actions and their effects on the desert tortoise, including the programmatic biological opinion for the Military Use of the CMAGR, California (1-6-96-F-40) (Service 1996) and the Target Complex Invader (Service 2015). The measures outlined herein are intended to reduce the potential for death or injury to individual tortoises, reduce or minimize negative impacts on tortoise habitat, and monitor population trends.

- 1) The MCAS Yuma Tortoise Management Representative within the Range Management Department would ensure compliance with protective stipulations by all users of SWATs 4 and 5. This representative has the authority to halt activities that may be in violation of such provisions. The Tortoise Management Representative also would coordinate with the designated Service representative on all matters concerning desert tortoise mitigation and management responsibilities. The Tortoise Management Representative does not have to be a qualified desert tortoise biologist and therefore would receive instructions from a qualified desert tortoise biologist in the handling, data collection, and release procedures for desert tortoise prior to engaging in such activities. MCAS Yuma would submit the name(s) and credentials of the person(s) that would be the Tortoise Management Representative or appointee(s) (see item 5 for additional information). Only qualified desert tortoise biologists, the Tortoise Management Representative, or appointees ('appointee' is defined as a person having the same qualifications as the Tortoise Management Representative) would handle desert tortoises.
- 2) All personnel accessing the CMAGR would participate in MCAS Yuma's existing tortoise education program, which has been developed cooperatively with the Service. The program

would include, at a minimum, the following topics: (1) occurrence of the desert tortoise; (2) sensitivity of the species to human activities; (3) legal protection for desert tortoises; (4) penalties for violations of federal law; (5) general tortoise ecology and activity patterns; (6) reporting requirements; (7) measures to protect tortoises; (8) personal measures that users can take to promote the conservation of desert tortoises; and (9) procedures and a point of contact if a desert tortoise is observed on site. All users of SWATs 4 and 5 would be informed of their responsibility to report any form of take to the Tortoise Management Representative.

- 3) All personnel accessing the CMAGR would be informed of their responsibility to report any form of take to the Tortoise Management Representative. If a tortoise is found in a project site, activities may, if appropriate, be modified to avoid injuring or harming it and MCAS Yuma Tortoise Management Representative shall be contacted immediately.
- 4) Range Management personnel would be responsible for periodically reminding all personnel of the protective measures for tortoises.
- 5) Desert Tortoise Handling Procedures
 - a. Only biologists authorized by the Service shall handle desert tortoises, except in circumstances in which the life of the desert tortoise is in immediate danger (see item 5d, below). For biologists not already authorized, MCAS Yuma shall submit their credentials to the Service for review and approval at least 30 days before the initiation of any activity within desert tortoise habitat.
 - b. Desert tortoises shall be moved only by an authorized biologist and solely for the purpose of moving the animals out of harm's way. Desert tortoises shall be moved the minimum distance to ensure their safety.
 - c. All handling of tortoises and their eggs and excavation of burrows are to be conducted by an authorized biologist in accordance with up-to-date protocols accessed at the Service website (<http://www.fws.gov/carlsbad/PalmSprings/DesertTortoise.html>).
 - d. If an emergency situation exists and a tortoise must be moved out of immediate danger, the animal may be moved to an adjacent shaded area (normally plant cover) out of direct sunlight. Desert tortoises shall only be moved the minimum distance to ensure their safety. Range Management shall be notified.
- 6) An annual monitoring report would be prepared and delivered to the Service on or before 15 January of each year. The report would briefly outline the effectiveness of the desert tortoise mitigation measures and summarize desert tortoise injuries or mortalities. To enhance desert tortoise protection, the report would make recommendations for modifying or refining existing measures.
- 7) The action area would be included in the rotation of ranges that are currently surveyed during ongoing annual surveys at the CMAGR (as funds are available). Surveys are conducted using the Service-recommended methods by qualified desert tortoise biologists. Surveys are conducted within existing safety protocols and mission parameters at the designated target area(s) within the CMAGR during regularly schedule range closures in the spring and all data are collected and entered into the MCAS Yuma Geographic Information System database. The

results of monitoring are included in the annual monitoring report prepared by MCAS Yuma and delivered to the Service on or before 15 January of each year. Any changes in survey methodology would be reported to the Service in an annual monitoring report.

- 8) In accordance with the existing biological opinion for the CMAGR (1-6-95-F-40; Service 1996), the boundaries of the new construction or other ground-disturbing activity would be determined in the field, mapped, and marked with monuments prior to initial target placement. New construction or other ground-disturbing activity would be placed outside of and away from surface drainages, where feasible. All new construction or other ground-disturbing activity would be within the designated boundaries. Clearance surveys conforming to Service protocols would be followed for the initial siting of all construction or other ground-disturbing activity. A qualified desert tortoise biologist or the Tortoise Management Representative would also be on-site during initial target placement.
- 9) An authorized desert tortoise biologist would be "on-call"/available during construction to address the situation if a desert tortoise is encountered. The MCAS Yuma Range Management Department would provide the Service the name(s) and qualifications of the biologist(s) for review and approval.
- 10) Any excavations associated with construction and maintenance that would be left open in areas that are not being monitored shall either be fenced temporarily to exclude desert tortoises, covered at the close of each work day, or provided with ramps so desert tortoises can escape. All excavations shall be inspected for desert tortoises before filling.
- 11) A tortoise exclusion fence would be installed around each construction site before construction. A qualified desert tortoise monitor would be present during the initial activity at each construction site. Once a tortoise fence is installed around each construction site and the clearance surveys are completed, the monitor would no longer need to be present at the site. If a tortoise is found in the action area during construction activities, the tortoise would be allowed to move away on its own free will or would be safely moved by an approved desert tortoise biologist. Following construction, the tortoise fences would be removed.
- 12) All personnel conducting service road construction, construction/training activities, and operational range clearance (e.g., EOD personnel) would monitor 'take' as part of their sweeps of activity areas. Personnel would report to the Tortoise Management Representative any injured or dead tortoises located, as well as habitat damage outside of the designated activity area. Personnel would fill out a form after construction/training activities and EOD clearance activities, reporting any take. The Tortoise Management Representative (or appointee) would be present during all construction and EOD clearance activities and available to respond to individual EOD and range maintenance crews (who would be trained per Measures 2 and 3) in the event the crews observe tortoise mortality/take, habitat damage, or need to have a tortoise relocated.
- 13) The project proponent would designate a Field Contact Representative (FCR) once ground clearing is completed and the desert tortoise fences are installed. The FCR would be

responsible for overseeing compliance with biological resources conservation measures and any other required terms and conditions resulting from consultation between the USMC and Service. The FCR would be on-site during all construction activities. The FCR would have a copy of all avoidance and minimization measures during construction activities. The FCR may be a crew chief, field supervisor, project manager, or a contracted biologist. The FCR would have the authority to halt construction, operation, or maintenance activities that are in violation of these requirements. A representative from MCAS Yuma Range Management Department would make bi-weekly visits to ensure compliance.

- 14) Boundaries of all target sites, existing and proposed, would be determined in the field, mapped, and flagged. All new target constructions would be placed within the boundaries of the designated target site. An on-site tortoise monitor would be present during target placement.
- 15) Roads would conform to the natural contour of the land as much as possible to minimize grading, and would avoid existing perennial plants as much as possible.
- 16) Vehicles traveling along construction roads and access roads, or any road within critical habitat, shall not exceed 20 miles per hour. All roads entering critical habitat would be posted with speed limits of 20 miles per hour.
- 17) All personnel operating vehicles within tortoise habitat on the CMAGR would inspect underneath their parked vehicle before moving it. If a desert tortoise is found beneath a vehicle, the Tortoise Management Representative or qualified appointee(s) would be contacted and the vehicle would not be moved until the Tortoise Management Representative removes it from harm's way or the tortoise leaves on its own accord.
- 18) No pets would be permitted at any time within SWATs 4 and 5. Military working dogs are permitted, but only under the control of their handler.
- 19) All ground personnel that enter SWATs 4 and 5 would be required to remove all food stuffs, trash, or other waste that may attract common ravens (*Corvus corax*) and other desert tortoise predators, in accordance with existing regulations for the CMAGR. Any temporary trash receptacles would be equipped with latching/locking lids. The Tortoise Management Representative would be responsible for ensuring that trash is removed regularly from the project area and that the trash containers are kept securely closed when not in use. MCAS Yuma would employ the following measures to further discourage raven settlement:
 - a. Spikes (e.g., nixalite) or other deterrents would be installed on structures (e.g., sniper towers) to prevent perching by common ravens and raptors.
 - b. Abandoned vehicles found on the CMAGR would be inventoried and steps would be taken to remove them.
 - c. Public use is restricted and would continue to be restricted in the CMAGR, thus reducing the raven attraction towards people.
 - d. Cattle grazing and cattle watering troughs are restricted on the range and would remain as such for security and raven prevention.
 - e. Range signs and fencing would be limited to a minimum to reduce the number of

elevated perches.

- f. Training operations and personnel would be required to properly dispose of food and trash per Station Order (StaO) 3710.63.
- g. Construction activities would have appropriate trash receptacles per StaO 3710.63.
- h. Construction personnel, range wardens, range inspectors, and troops using the training areas would be educated and instructed to report any raven sightings which would be investigated and documented by MCAS Yuma biologists.
- i. Any raven or raven nests discovered on the CMAGR would be evaluated by MCAS Yuma biologists for tortoise predation. Additionally, when any raven-damaged tortoise shells are found, the surrounding area would be searched for raven and raven nests. Upon completion of any necessary environmental review, and in accordance with appropriate permitting, any predatory ravens and their nests would be removed using methods similar to those identified in the March 2008 "Reduce Common Raven Predation on the Desert Tortoise" environmental assessment (Service 2008).
- j. Periodically, all wildlife guzzlers would be inspected by biologists, range inspectors, and range wardens for raven usage. Observations of tortoise carcasses and raven nests near guzzlers would result in further evaluation for removal.

- 20) The Tortoise Management Representative or appointee(s) would survey all ground support areas for dead or injured tortoises after the completion of each ground operation.
- 21) Should a dead or injured tortoise be located on-site during or after any military activity, the MCAS Yuma Range Management Department would be notified immediately. The Service would be notified by the Tortoise Management Representative via email within three working days of the discovery of any tortoise death or injury caused by military activity. Notification would include the date, time, circumstances, and location of any injury or death. Dead animals would be buried to avoid attraction of scavengers. Injured animals would be taken to a veterinarian approved by the Service. Information to be provided to the Service would include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and any other pertinent information.
- 22) In an effort to control the spread of invasive (non-native) weeds, all construction-type equipment and/or construction-type vehicles originating outside of the CMAGR shall be power-washed before entering roadways on the way to the CMAGR. While washing wheeled vehicles, the front wheels shall be turned lock-to-lock to allow for exposure of surfaces that may hold soil or weed seeds.
- 23) Vehicles would remain on established roads except as required for mounted LFAM training activities. To reduce potential impacts, vehicles used during LFAM training activities would stay within the confines of road boundaries until the designated range is reached.
- 24) After reconfiguration and construction activities for the SWATs 4 and 5 are completed, operations will return to normal and be directed by this amended biological opinion together with the original biological opinion issued to CMAGR (Service 1996).

Incidental Take

The 1996 programmatic biological opinion exempted take in the form of injury or mortality of 11 desert tortoises and capture/harassment of 112 animals annually, across the CMAGR (Service 1996). Estimated take of large desert tortoises associated with the reconfiguration of SWATs 4 and 5 (three annually in the form of mortality and 26 in the form of harassment over the course of operations) falls within the threshold previously established. No take has been reported in recent years under the programmatic biological opinion; thus, the incremental amount of estimated take associated with the proposed action is not likely to exceed take limits set forth in 1996. However, we emphasize the importance of adherence to Conservation Measure 9 (Annual Desert Tortoise Surveys and Reporting) to ensure these thresholds are not exceeded.

The nature of the proposed action is similar in scope to the activities previously addressed in the programmatic biological opinion (Service 1996), and it includes all conservation measures identified for the original action. The measures described in the 1996 programmatic biological opinion as well as the additions and revisions included herein are non-discretionary; the CMAGR and/or its contractors must adhere to them for the exemption in section 7(o)(2) to apply. If the CMAGR fails to implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of the incidental take, the CMAGR must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 Code of Federal Regulations 402.14(i)(3)].

If you have any questions, please contact Jody Fraser of my office at jody_fraser@fws.gov or (760) 322-2070, extension 207.

Sincerely,



for Kennon A. Corey
Assistant Field Supervisor

LITERATURE CITED

[MCASY] Marine Corps Air Station Yuma. 2015. DRAFT Integrated Natural Resources Management Plan. WESS Serial Number: 1421461591419).

U.S. Department of the Navy and U.S. Marine Corps. 2015. Final Biological Assessment for the Proposed Range Redesign of Special Warfare Training Areas 4 and 5, Chocolate Mountains Aerial Gunnery Range, Imperial and Riverside Counties, dated May 2015.

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[Service] U.S. Fish and Wildlife Service. 1996. Biological Opinion for the Military Use of the Chocolate Mountain Aerial Gunnery Range (1-6-95-F-40). Letter to the Director, Range Management, U.S. Marine Corps Air Station, Yuma, Yuma, Arizona. Dated April 18, 1996. Carlsbad Fish and Wildlife Office, Carlsbad, California.

[Service] U.S. Fish and Wildlife Service. 2008. Final Environmental Assessment to Implement a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on the Desert Tortoise. Ventura Fish and Wildlife Office, Ventura, California.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services

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In Reply Refer To:
FWS-IMP-15B0239-15F0541

SEP 14 2015

William Sellars, Range Management Director
United States Marine Corps
Marine Corps Air Station Yuma
Box 99100
Yuma, Arizona 85369-9100

Subject: Proposed Target Complex Invader – Amendment to Biological Opinion 1-6-95-F-40 for Military Use of the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Dear Mr. Sellars:

This document constitutes an amendment to the programmatic 1996 Biological Opinion for Military Use of the Chocolate Mountain Aerial Gunnery Range [U.S. Fish and Wildlife Service (Service) 1996; File No. 1-6-95-F-40] with some clarifications. The Service received your electronic request for formal consultation on April 30, 2015, and clarifications on May 6, 2015, via electronic mail, at which time formal consultation was initiated. This amendment adds to the proposed action the construction and operation of the proposed Target Complex Invader and analyzes its effects on the federally threatened Mojave desert tortoise (*Gopherus agassizi*) and its designated critical habitat in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*).

The Target Complex Invader is located in Training Area 1, which was previously subject to closure of the Navy Seal Fast Attack Vehicle driving course operations. Aerial bombing within this portion of the range was addressed under the programmatic biological opinion. However, all new target sites must be reviewed to determine if the scope and magnitude of impacts comport with that which was contemplated under the programmatic opinion. We have determined that, from a procedural and biological perspective, the description of the proposed action and the level of impacts to the desert tortoise and its habitat are consistent with the intent of the original programmatic consultation. Therefore, we are amending the 1996 biological opinion to include the Target Complex Invader.

This biological opinion is based on information provided in the following documents: (1) *Biological Assessment for the Target Complex Invader, Chocolate Mountains Aerial Gunnery Range* dated May 2015 [Marine Corps Air Station Yuma (MCASY) 2015a]; (2) programmatic Biological Opinion for the Military Use of the CMAGR (Service 1996); (3) various communications between the MCASY and the Service; and (4) other information available in our files.

CONSULTATION HISTORY

Between March 2014, and August 2015, staff from the Palm Springs Fish and Wildlife Office (PSFWO) worked with the MCASY to clarify the project description; effects to the desert tortoise and its designated critical habitat; and avoidance and minimization measures. Efforts to clarify these issues included conducting site visits and meetings, assessing baseline conditions, providing comments on the biological assessment, and providing comments on additional information received regarding effects to desert tortoise.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed target consists of a 279.6-acre action area comprised of a 99-acre target area, including a 153.5-acre buffer area, the associated 21.4-acre landing zone [(LZ); consists of 2.4-acre LZ plus 350-foot buffer], three observation posts (OPs), each considered a single point within a 2-acre area, and the associated access roads to each of the target components (Figures 1 and 2). The primary causes of potential injury or mortality to desert tortoises associated with the proposed action are direct impact from ordnance, including damage or destruction of burrows, collisions with vehicles, and habitat degradation. The level of impact would be similar to that which was evaluated in the original biological opinion for activities on the CMAGR (Service 1996), and all effects would occur within the existing boundary and training framework of the CMAGR. Target Complex Invader would provide users with a new area to conduct standardized advanced tactical training including the weapons and tactics instructor (WTI) course, which occurs two times per year (April and September to coordinate with Military Occupational School, graduation, and deployment cycles), and other approved training use.

The project site is located within and adjacent to the existing restricted airspace R-2507S. Aircraft operations associated with the proposed action would be within the tempo of current operations in R-2507S. CMAGR aircraft users access the range via VR1267 flight route. This route is oriented northwest to southeast and parallels the Bradshaw Trail. Pilots enter and exit the corridor to their various target areas on the CMAGR between 200 and 1500-feet above ground level altitude. No new Military Training Routes (MTRs) (i.e., aerial routes that provide for high-speed military flights below 10,000 feet above mean sea level) would be required to support training activities at Target Complex Invader, and the use of MTRs by aircraft supporting the proposed action would be the same as current operations at the CMAGR.

Establishment of Target Complex

The targets will be placed near existing roads and affixed using a 7-ton flatbed truck and 4-wheel drive forklift. Before the placement of the targets, a baseline Operational Range Clearance will be conducted to ensure that the area is clear of any range debris or errant munitions debris. This would establish the baseline level of contamination and ensure the safety of the target crews. Once the survey is complete, the truck would utilize established roads adjacent to the target emplacement area. A 4-wheel drive forklift would off-load the targets from the flatbed of the truck and drive a short distance on a new unimproved service road to place the target at the established target grid/points. No grading or clearing

of vegetation would occur. Access to and within the target area is described in detail in the “Access” section.

Any of the fixed-wing, rotary-wing, and tilt-rotor aircraft that currently operate within the CMAGR [including but not limited to Joint Strike Fighter (JSF)¹, F/A-18C/D², AV-8B, AH-1W, MV-22] could utilize the target area for air-to-ground delivery with conventional live high-explosive ordnance including precision-guided (i.e., GPS-guided) ordnance.

Target Area

The target area would be located on a total of 99 acres, plus a 153.5-acre buffer area, and would result in ground disturbance due to ordnance delivery in an area of the CMAGR not currently disturbed by training activities (Figure 2). Approximately 16 steel target replicas of enemy combat vehicles manufactured from recyclable ballistic steel would be located within the target area simulating tanks, self-propelled anti-aircraft guns, armored personnel carriers, and anti-aircraft guns. The targets would be positioned to expose training aircrews to conditions that are most like what they could expect to see in combat.

The targets will be placed near existing roads and affixed using a 7-ton flatbed truck and 4-wheel drive forklift. Before the placement of the targets, a baseline Operational Range Clearance will be conducted to ensure that the area is clear of any range debris or errant munitions debris. This would establish the baseline level of contamination is known and ensure the safety of the target crews. Once the survey is complete, the truck would utilize established roads adjacent to the target emplacement area. The forklift would offload the targets from the flatbed of the truck and drive a short distance on a new unimproved service road to place the target at the established target grid/points. No grading or clearing would occur.

Any of the fixed-wing, rotary-wing, and tilt-rotor aircraft that currently operate within the CMAGR could utilize the target area for air-to-ground delivery with conventional live high-explosive ordnance including precision-guided ordnance. The use of ordnance would be consistent with range standard operating procedures that describe the type of ordnance that may be utilized on a given target area. Ordnance operations would be coordinated with the Range Scheduling Officer at MCASY. High explosive ordnance deliveries throughout the CMAGR are currently limited to the hours of 6:00 a.m. to 10 p.m. for off-range noise abatement purposes (MCASY Station Order 3710.6). Combat tactics may lead an aircrew to attack a target with either a single bomb or with multiple bombs in a single pass.

A weapons danger zone (WDZ) would be established around the target area for each type of aircraft, weapon, and method of weapon delivery utilizing the target area including the target area terrain

¹ JSF does not currently employ the use of live ordnance during training activities within the CMAGR. However, the future use of live ordnance within training ranges at the CMAGR will occur on approved attack/delivery profiles similar to other fixed-wing aircraft currently operating within the CMAGR. This use was approved as part of a separate NEPA action.

² Incorporation of the JSF aircraft into the training environment at the CMAGR began in 2013–2014 with the number of sorties expected to increase over time. Because the JSF is the replacement aircraft for the phasing out of the F/A-18 and AV-8B, a commensurate decline and eventual cessation of training with the F/A-18 and AV-8B is expected.

considerations. A WDZ defines the ground and airspace needed to laterally and vertically contain projectiles, fragments, debris, and components resulting from the firing, launching, and or detonation of aircraft delivered ordnance. The Department of Defense standard for risk acceptance on all ranges is a 99.9999 percent level of containment, which means that the probability of a hazardous fragment escaping the containment area is one in a million.

Target repair would be conducted a minimum of two times per year with scheduled range closures occurring prior to WTI training in April and September. Marine Corps explosive ordnance disposal (EOD) teams would conduct a surface sweep before target repair activities to identify any potential hazards from unexploded ordnance (UXO) to equipment or personnel. The location of the target corners would be recorded so that the targets would be placed in the same location after target repair. In addition, operational range clearance would occur every 1 to 2 years for roughly 15–20 days in accordance with the existing operational range clearance program.

Similar to target repair, operational range clearance would be conducted during the scheduled range closure prior to WTI training in either April or September. The purpose of the program is to destroy and remove military munitions, including UXO and munitions debris, and other range-related debris from range targets. This is done to maintain or enhance operational range safety and prevent the accumulation of such material from impairing or preventing continued operational range use. The level of operational clearance needed would be based on the amount of use and the estimated amount of UXO and could involve both surface and sub-surface removal. The surface clearance of UXO would involve teams of UXO technicians using a magnetometer (metal detector) and soft-tired all-terrain vehicles. The UXO technician teams would establish a 100- by 100-foot grid system of the area to be cleared. Team members would be spaced no more than 5 feet apart and travel in north/south direction within each grid, collecting target scrap and munitions debris from the surface of the range. Small debris would be consolidated into 5-gallon buckets. A backhoe would be used to consolidate larger items. Debris would be separated based on the specific type, processed accordingly, and transported off Range for disposal. Subsurface clearance would occur within an approximately 100-foot radius of each target, as needed. Both target repair and operational range clearance would require up to four vehicles per day.

Landing Zone

The LZ would provide MAWTS-1 and other users, upon request, with an approved site for insertion and extraction of personnel by rotary-wing and tilt-rotor aircraft in direct support of the mission. The proposed LZ would be 2.4 acres (Figure 2). The LZ would not be modified (i.e., graded or cleared of vegetation) because it currently meets the criteria of a tactical LZ in that it is relatively free of vertical obstructions, relatively flat, and able to support the weight of an aircraft without it sinking into the substrate (i.e., soil or snow). The aircraft operation may land anywhere within the LZ except within the surface drainages.

The purpose of the proposed LZ would be to provide tactical insertion and extraction of ground troops to the OPs. Typical landing and takeoff operations consist of a low level approach to the LZ to allow a pilot to visually inspect the area and select a specific landing site that is free of all obstacles (e.g., uneven terrain). The pilot lands the aircraft only when the area is determined safe. This type of training

enables pilots and flight crews to identify a LZ, transition into an appropriate approach, land, insert ground troops, and then subsequently take off in a variety of weather conditions (i.e., rain, lighting, cloud cover, etc.) and in different types of terrain. Rotary-wing and tilt-rotor aircraft that currently operate within the CMAGR in support of the WTI Course and other training activities would utilize the LZ.

Observation Posts

The proposed OPs would be located at approximately 985 feet, 2,300 feet, and 3,940 feet from the target area. The OPs would be approved for the operation of ground-based lasers for designating targets for aircraft in accordance with MCASY guidance. The OPs would provide MAWTS-1 and other users with pre-designated locations from which ground-based forward air controllers could coordinate a strike on the enemy. Ground-based forward air controllers and tactical air control parties play an essential role in combat to the benefit of both allied forces ground troops and aircrews by ensuring that close air support can be effectively brought to bear on an enemy. The main role of the ground-based forward air controller is to arrange air support missions, direct and control aircraft, direct ordnance deliveries, and communicate battlefield intelligence such as enemy locations, strength, and activities to their command. Because of their frequent placement on or behind enemy lines, they must operate covertly and independently for long periods of time and with minimal support. Typically, the OP would be utilized by a team tactically inserted and extracted from the LZ in the same day. However, occasionally during WTI training, a team of up to four forward air controllers could be stationed at the OPs for up to 2 days to coordinate a strike on the enemy at Target Complex Invader. The inserted troops would remain at the OPs until extracted from the LZ following the training exercise. Given the covert nature of their task, minimal equipment is utilized by the ground-based forward air controllers and no trace or evidence of their activities would be left behind. All equipment would be packed within a single Marine's battle gear and packed out on foot.

Access

Access to Target Complex Invader is 15 miles from the pavement of Route 78 to the staging area at Camp Burt (entry of range); from Camp Burt to the target area is 12 miles. Existing roads in the CMAGR would be used to access the target for initial target placement and maintenance activities (target repair and operational range clearance). An unimproved service road stemming from the existing road would be developed within the target area to allow for target placement and maintenance and operational range clearance activities. The conditions of the existing roads vary from graded dirt surfaces to four-wheel drive tracks; none are paved. Public access to the CMAGR and its road network is prohibited at all times because of the hazards presented by the use of live ordnance and to prevent interruption of military training. A new unimproved service road stemming from the existing road would be developed within the target area to allow for authorized access for target placement and maintenance and operational range clearance activities. The specific location of the tracks would be determined following the initial range clearance, with consideration toward personnel safety, most direct routing, long-term logistical requirements, and minimization of impacts to natural and cultural resources, but would generally be a direct line from the existing road to the target points. This would be the only route that a vehicle would be allowed to drive off road. An MCASY biologist would accompany the target crew for the initial service road route selection for desert tortoise avoidance

and/or other flora/fauna conflicts. The service road would be swept by Operational Range Clearance or EOD personnel before each use. Once the service road is deemed clear before the initial target emplacement, it would be marked by a series of small wooden stakes. The new service road would not be graded or maintained and would not be used more than twice per year during target maintenance and operational range clearance activities. Due to the highly restrictive access nature of the CMAGR and intended use of the Target Complex Invader, the service road would be used by the Maintenance Team and EOD personnel only. The target delivery vehicles would use standard rubber tires and must use routes that are obstruction/plant free.

Conservation Measures

The proposed action incorporates a number of species-specific measures to ensure avoidance and minimization of take of desert tortoises. These are based on a review of the potential project effects and incorporate applicable conservation measures and terms and conditions from the original biological opinion addressing similar actions and potential impacts to the desert tortoise (Service 1996). Several measures incorporate the proposed project area into existing desert tortoise management activities currently prescribed across CMAGR ranges. The responsible party is identified specifically in the measure. Other measures pertaining to safety protocols for hazardous materials releases and prevention, fire prevention and management, and general desert tortoise management are included in various station orders and the current draft of the CMAGR Integrated Natural Resources Management Plan (MCASY 2015b).

- CM 1 Tortoise Management Representative.** The MCASY Tortoise Management Representative within the Range Management Department will ensure compliance with protective stipulations by all users of Target Complex Invader. This representative has the authority to halt activities that may be in violation of such provisions. The Tortoise Management Representative also will coordinate with the designated Service representative on all matters concerning desert tortoise mitigation and management responsibilities. The Tortoise Management Representative does not have to be a qualified desert tortoise biologist and therefore will receive instructions from a qualified desert tortoise biologist in the handling, data collection, and release procedures for desert tortoise prior to engaging in such activities. MCAS Yuma will submit the name(s) and credentials of the person(s) that will be the Tortoise Management Representative or appointee(s). Only qualified desert tortoise biologists, Tortoise Management Representative, or appointees ('appointee' is defined as a person having the same qualifications as the Tortoise Management Representative) will handle desert tortoises.
- CM 2 Tortoise Education Program.** All military personnel involved in ground operations (hereafter "users") of Target Complex Invader, which include EOD and range clearance teams, target building personnel, training personnel dropped at observation posts, and users of the LZ, will participate in MCASY's existing tortoise education program, which has been developed cooperatively with the Service. The program will include, at a minimum, the following topics: 1) occurrence of the desert tortoise; 2) sensitivity of the species to human activities; 3) legal protection for desert tortoises; 4) penalties for violations of federal law; 5) general tortoise ecology and activity patterns; 6) reporting requirements; 7) measures to

protect tortoises; 8) personal measures that users can take to promote the conservation of desert tortoises; and 9) procedures and a point of contact if a desert tortoise is observed on site. All users of Target Combat Invader will be informed of their responsibility to report any form of take to the Tortoise Management Representative.

- CM 3 Desert Tortoise Reporting.** All users of Target Combat Invader will be informed of their responsibility to report any form of take to the Tortoise Management Representative. If a tortoise is found in a project site, activities may, if appropriate, be modified to avoid injuring or harming it and MCASY Tortoise Management Representative shall be contacted immediately.
- CM 4 Off-Road Ground Vehicle Prohibitions and Speed Limits.** All off-road ground vehicle use shall be prohibited within Target Complex Invader, except for activities associated with target placement/repair and ordnance removal and range maintenance. As part of range clearance activities across the CMAGR, EOD personnel are responsible for periodically reminding all escorted range users of the prohibitions regarding off-road vehicular travel and of other protective measures for tortoise. Vehicles traveling along roads inside critical habitat should not exceed 20 miles per hour. All road-killed wildlife species will be buried to prevent attraction of ravens (*Corvus corax*, raven) and other desert tortoise predators.
- CM 5 Vehicle Inspections.** All personnel operating vehicles within Target Complex Invader will inspect underneath their parked vehicle, prior to moving it. If a desert tortoise is found beneath the vehicle, the Tortoise Management Representative, or qualified appointee(s), will be contacted to remove the animal from harm's way.
- CM 6 Pet Prohibitions.** No pets will be permitted anytime within Target Complex Invader. Military working dogs will be permitted, under control of their handler if required.
- CM 7 Waste Management.** All ground personnel that enter Target Complex Invader will be required to remove all food stuffs, trash, or other waste that may attract common ravens and other desert tortoise predators, in accordance with existing regulations for the CMAGR. Any temporary trash receptacles will be equipped with latching/locking lids. Range users will be responsible for ensuring that trash is removed regularly from the project area and that the trash containers are kept securely closed when not in use. The Tortoise Management Representative will monitor compliance and report issues to the MCASY Conservation Manager.
- CM 8 Clearance Surveys during Initial Target Placement.** In accordance with the programmatic biological opinion (Service 1996), the boundaries of the proposed target sites will be determined in the field, mapped, and marked with monuments prior to initial target placement. Target sites will be placed outside of and away from surface drainages. All new targets will be placed within the boundaries of the designated target site. Clearance surveys conforming to Service recommendations will be followed for the initial placement of the targets. A qualified desert tortoise biologist or the Tortoise Management Representative will also be on-site during initial target placement.

- CM 9 Annual Desert Tortoise Surveys and Reporting.** The action area will be included in the rotation of ranges that are currently surveyed during ongoing annual surveys at the CMAGR. Surveys are conducted using the Service-recommended methods by qualified desert tortoise biologists and are used to inform the desert tortoise population baseline on the CMAGR as well as to document take. Surveys are conducted within existing safety protocols and mission parameters at the designated target area(s) within the CMAGR during regularly schedule range closures in the spring and all data are collected and entered into the MCASY Geographic Information System (GIS) database. The results of monitoring are included in the annual monitoring report prepared by MCASY and delivered to the Service on or before 15 January of each year. Any changes in survey methodology will be reported to the Service in an annual monitoring report.
- CM 10 Tortoise Monitoring during Service Road Construction, Target Repair, and EOD Clearance Activities.** All personnel conducting service road construction, target repair, and operational range clearance will monitor ‘take’ as part of their sweeps of target areas. Personnel will report to the Tortoise Management Representative any injured or dead tortoises located, as well as habitat damage outside of the designated target area. Personnel will fill out a form after target repair and EOD clearance activities, reporting any take. The Tortoise Management Representative (or appointee) will be present during all target repair and EOD clearance activities and available to respond to individual EOD and target maintenance crews (who will be trained per Measures 2 and 3) in the event the crews observe tortoise mortality/take, habitat damage, or need to have a tortoise relocated.
- CM 11 Notify Service of any Take of Desert Tortoise.** The Service will be notified by the Tortoise Management Representative within 3 working days of the discovery of any tortoise death or injury caused by military activity. Notification will include the date, time, circumstances, and location of any injury or death. Dead animals will be left in situ. Injured animals will be taken to a veterinarian approved by the Service.
- CM 12 Invasive Plant Species Control.** In an effort to control the spread of invasive (non-native) weeds, all construction-type equipment and/or construction-type vehicles originating outside of the CMAGR shall be power-washed before entering roadways on the way to the CMAGR. While washing wheeled vehicles, the front wheels shall be turned lock-to-lock to allow for exposure of surfaces that may hold soil or weed seeds.
- CM 13 Raven Management.** The common raven is becoming an increasing threat to the desert tortoise. Common ravens are “human commensals” and thrive in highly disturbed habitats including agriculture, suburban, and urban areas. Their reproductive success in the California deserts is enhanced by proximity to human developments. Additionally, water subsidies are thought to be an important factor contributing to raven increase in desert ecosystems. Subsidized water sources include cattle watering troughs, wildlife guzzlers, irrigation canals, reservoirs, sewage treatment areas, and irrigated agricultural areas. A lack of adequate nesting and roosting substrates, food sources, water sources, human activity, agriculture, and the general remote location, has likely kept raven densities on CMAGR low. In an effort to

discourage raven establishment, MCASY will employ the following measures:

- CM 13a.** Abandoned vehicles found on the CMAGR will be inventoried and steps taken toward their removal.
- CM 13b.** Public use is restricted and will continue to be restricted in the CMAGR, thus reducing the raven attraction.
- CM 13c.** Cattle grazing and cattle watering troughs are and will remain restricted on the range.
- CM 13d.** Range signs and fencing will be minimized to reduce perching.
- CM 13e.** Training operations and personnel will be required to properly dispose of food and trash per Station Order 3710.63.
- CM 13f.** Construction activities will have appropriate trash receptacles per Station Order 3710.63.
- CM 13g.** Construction personnel, range wardens, range inspectors, and troops using the training areas will be educated and instructed to report any raven sightings, which will be investigated and documented by MCASY biologists.
- CM 13h.** Any raven or raven nests discovered on the CMAGR, including on transmission infrastructure, will be evaluated by MCASY biologists for desert tortoise predation. If any evidence of predation is observed, the surrounding area will be searched for raven and raven nests. Any predatory ravens and their nests will be removed using similar methods identified in the Service's environmental assessment, Reduce Common Raven Predation on the Desert Tortoise (Service 2008), with appropriate permitting and coordination with the utility operator.
- CM 13i.** Periodically, all wildlife guzzlers will be inspected by biologists, range inspectors, and range wardens for raven usage. Observations of desert tortoise carcasses and raven nests near guzzlers will prompt further evaluation for removal.

CM 14 Operations under Existing Biological Opinion. After development activities for the target complex are completed, operations will return to normal and be directed by this biological opinion together with the original biological opinion issued to CMAGR (Service 1996).

STATUS OF THE SPECIES AND CRITICAL HABITAT RANGE-WIDE

The following section summarizes information about the desert tortoise on the legal/listing status, distribution and population trends, current threats, and status of critical habitat as discussed in the Service's revised recovery plan (Service 2011a), the current 5-year review (Service 2010a), and the

recent biological opinion on Blythe Solar Energy Project (Service 2014a). Please refer to those documents for additional detailed information about these topics and the species' description, life history, and habitat affinities.

Legal/Listing Status

The Mojave population of desert tortoise was proposed for listing by the Service on October 13, 1989, and listed as a threatened species on April 2, 1990 (Service 1989, 1990). The desert tortoise also is listed as a threatened species under the California Endangered Species Act (Act). The Service designated about 6.5 million acres of critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah on February 8, 1994 (Service 1994a). The original recovery plan for the species was approved in 1994 (Service 1994b) and a revised plan was published in 2011 (Service 2011a).

Since listing, the desert tortoise has been split into two species, Mojave desert tortoise (*Gopherus agassizii*, Mojave desert tortoise) and Sonoran desert tortoise (*Gopherus morafkai*). The newly defined Mojave desert tortoise is analogous to the listed entity, and thus the taxonomic revision does not affect its listing status. For more information on the revision and the listed species, please see Murphy *et al.* (2011) and Averill-Murray (2011).

Distribution and Population Trends

Desert tortoise habitat in the California desert is characterized as *Larrea tridentate* (creosote bush) scrub below 5,500 feet in which precipitation ranges from 2 to 8 inches, where production of annual plants is high. Desert tortoises are also found in areas where the diversity of perennial plants is relatively high. The Mojave desert tortoise range is north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran/Colorado Desert of California.

Population trend analyses from the range-wide monitoring program between 2004 (1999 in Utah) and 2012 revealed large annual increases (+13.6 percent) of adult tortoises (*i.e.*, ≥ 180 millimeters carapace length) in the Northeastern Mojave Recovery Unit, with the rate of increase apparently resulting from increased survival of adults and subadult tortoises growing into the adult size class (Service 2014b). However, populations in the other 4 recovery units are declining: Upper Virgin River (–5.1 percent per year), Eastern Mojave (–6.0 percent), Western Mojave (–8.6 percent), and Colorado Desert (–3.4 percent; note that 2 tortoise conservation areas in this recovery unit, Joshua Tree and Piute Valley, may be stable or increasing on average. It is important to remember that these trends represent overall averages across large areas; local populations within each tortoise conservation area may be responding differently than the population as a whole. For example, even though the population in Joshua Tree National Park has increased by an estimated 5.5 percent per year since 2004 (a 56 percent increase overall), the local population near the “Barrow plot” declined greatly between 1996 and 2012 (Lovich *et al.* 2014). Based on the overall trend estimates, populations in tortoise conservation areas ranged from 1,576 to 18,981 adult tortoises as of 2012, with an overall reduction of 47,393 adult

tortoises since 2004 (–29 percent) [from analyses in Service (2014b) and Allison and McLuckie, in review].

Estimates of juvenile tortoise density are unavailable due to difficulties in sampling smaller sizes, but we have some information about changes in juvenile numbers relative to adult densities. Declining proportions of juvenile tortoises observed in the Western Mojave and Colorado Desert recovery units reinforce concerns about the status of tortoise populations in those units due to an apparent reduction in younger cohorts that might otherwise have bolstered declining adult numbers (Allison and McLuckie, in review).

Habitat modeling indicates that, historically, the Mojave desert tortoise occupied up to 20,543,770 acres (estimated from Nussear *et al.* 2009). However, Averill-Murray *et al.* (2013) estimated that 19 percent of this habitat has been lost, and more recent exploration of updated geospatial data and aerial imagery indicate that this is an underestimate of habitat. This reduction is not primarily a change in the boundaries of its range since publication of the original recovery plan in 1994 (Service 2010a), but a continuation of habitat loss within the original distribution. Prior to 1994, desert tortoises were extirpated from large areas within their distributional limits by urban and agricultural development (for example, in the cities of Barstow, Lancaster, Las Vegas, St. George; and in agricultural areas south of Edwards Air Force Base and east of Barstow), military training (for example, at Fort Irwin, Leach Lake Gunnery Range), and off-road vehicle use (for example, in portions of off-road management areas managed by the Bureau of Land Management and in areas of unauthorized off-road vehicle use such as areas east of California City). Since 1994, urban development around Las Vegas has likely been the largest contributor to habitat loss throughout the range. More recently, desert tortoises also have been essentially removed from the 18,197-acre southern expansion area at Fort Irwin (Service 2012a), with similar plans for large portions of the 167,971-acre expansion of the Marine Corps Air Ground Combat Center (Service 2012b). In addition, the remaining blocks of what were once continuous expanses of desert habitat have been fragmented by numerous roads and highways. Recent energy developments within desert tortoise habitat add to previous habitat loss and fragmentation.

The proposed project is within the former Eastern Colorado Recovery Unit (Service 1994b), which was consolidated with the Northern Colorado unit to form the Colorado Desert Recovery Unit in the revised recovery plan (Service 2011a). The *Draft Range-wide Monitoring of the Mojave Desert Tortoise: 2013 and 2014* (Service 2015) estimates a comparable 7.2 desert tortoises per square kilometer within the Chocolate Mountain sub-unit of the Colorado Desert Recovery Unit. However, this estimate is across the entire recovery unit, which has patches of varying densities.

Current Threats

The majority of threats to the desert tortoise and its habitat are associated with human land use changes. Threats include urbanization, upper respiratory tract disease and possibly other diseases, predation by common ravens and domestic and feral dogs, unauthorized off-highway vehicle activity, authorized vehicular activity, illegal collecting, mortality on paved roads, vandalism, drought, livestock grazing, feral burros, nonnative plants, changes to natural fire regimes, and environmental contaminants. For further discussion of individual threats, please see the revised recovery plan (Service

2011b) and the most recent 5-year review (Service 2010a). Since release of the 5-year review, utility-scale renewable energy development has become a greater threat to the desert tortoise. These threats include habitat loss and fragmentation, raven predation and transmission line construction, risk of collision with vehicles using new roads, and disturbance associated with renewable energy development.

Summary of the Status of Designated Critical Habitat for Desert Tortoise

The primary constituent elements of desert tortoise critical habitat were identified as sufficient space to support viable populations within each of the recovery units and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality. Critical habitat for the desert tortoise would not be able to fulfill its conservation role without each of the primary constituent elements being functional. The critical habitat units in aggregate are intended to protect the variability that occurs across the large range of the desert tortoise; the loss of any specific unit would compromise the ability of critical habitat as a whole to serve its intended function and conservation role. Despite the fact that desert tortoises do not necessarily need to move between critical habitat units to complete their life histories, both the original and revised recovery plans highlight the importance of these critical habitat units and connectivity between them for the recovery of the species (Service 1994a; Service 2011b).

Within each critical habitat unit, both natural and anthropogenic factors affect the function of the primary constituent elements of critical habitat. As noted in the revised recovery plan for the desert tortoise and 5-year review (Service 2011b, 2010a), critical habitat for the desert tortoise is subject to landscape level impacts in addition to the site-specific effects of human activities. On the landscape level, atmospheric pollution is increasing the level of nitrogen in desert substrates; the increased nitrogen exacerbates the spread of invasive plants, which out-compete the native plants necessary for desert tortoises to survive. As invasive plants increase in abundance, the threat of large wildfires increases; wildfires have the potential to convert the shrubland-native annual plant communities upon which desert tortoises depend to a community with fewer shrubs and more invasive plants. Under these conditions, shelter and forage would be more difficult for desert tortoises to locate.

Invasive plants have already compromised the conservation value and function of critical habitat to some degree with regard to the second primary constituent element (i.e., sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species). These effects likely extend to the entirety of critical habitat, given the human access and numerous routes by which invasive plants can access critical habitat and the large spatial extent that is subject to nitrogen from atmospheric pollution. (See maps from previous sections of this biological opinion regarding the extent of the threat of invasive plants and the aggregate stress that multiple threats, including invasive plants, place on critical habitat.)

Critical habitat has been compromised to some degree with regard to the last primary constituent

element (i.e., habitat protected from disturbance and human-caused mortality) as a result of the wide variety of human activities that continues to occur within its boundaries. These effects result from the implementation of discrete human activities that cause ground disturbance and are thus more site-specific in nature.

Although the remaining primary constituent elements have been affected to some degree by human activities, these impacts have not, to date, substantially compromised the conservation value and function of the critical habitat units. We have reached this conclusion primarily because the effects are localized and thus do not affect the conservation value and function of large areas of critical habitat.

Land managers have undertaken actions to improve the status of critical habitat. For example, as part of its efforts to offset the effects of the use of additional training maneuver lands at Fort Irwin (Service 2004), the Department of the Army acquired the private interests in the Harper Lake and Cronese Lakes allotments, which are located within critical habitat in the Western Mojave Recovery Unit; as a result, cattle have been removed from these allotments. Livestock have been removed from numerous other allotments through various means throughout the range of the desert tortoise. The retirement of allotments assists in the recovery of the species by eliminating disturbance to the primary constituent elements of critical habitat by cattle and range improvements.

In summary, desert tortoises have been eliminated from over 19 percent of their historical habitat, and almost 1/3 of the adult population was lost from “protected” areas in just over a decade. Half the adult tortoise population has been lost in the Western Mojave Recovery Unit in just over the last decade, and between 24 percent and 38 percent of the adult tortoise population has been lost during the same time in the Colorado Desert, Eastern Mojave, and Upper Virgin River recovery units. Importantly, these declines have occurred while recovery efforts under the original recovery plan (Service 1994b) should have been well established. In fact, tortoise densities are lower and mortality rates higher in a portion of designated critical habitat and Desert Wildlife Management Area in the Western Mojave Recovery Unit than purportedly less protected, adjacent private lands (Berry *et al.* 2014). Only in the Northeastern Mojave Recovery Unit have tortoise populations increased in recent years.

ENVIRONMENTAL BASELINE

Action Area

According to 50 CFR § 402.02, the “action area” means all areas to be affected directly or indirectly by the Federal action; the direct and indirect effects of the proposed action include associated physical, chemical, and/or biological effects of considerable likelihood (Service and NMFS 1998). Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon this action area.

The proposed action would be implemented at the CMAGR in Imperial County, California. The CMAGR is bound on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde mountains. The northern border is separated from the Orocopia Mountains by Salt Creek and includes part of the Chuckwalla Bench. The CMAGR extends south to Highway 78 near Glamis. The

project site is located approximately 9 miles northwest of Blue Mountain and underlies special use airspace (R-2507S).

The action area is defined as the area directly or indirectly affected by the proposed action. The action area includes: (1) the target area (252.5 acres, including buffer area), LZ, and OPs “footprint” (2 acres each); (2) proposed unimproved service road within the target area; and (3) surrounding areas, including access roads, that may be affected by noise, dust, and other project-related activities. For the target area, the action area is the proposed target area plus the buffer, which equates to the 99.9999 percent safety arc (i.e., WDZ). All potential target area effects would occur within this buffer (including misses), although reasonably the effects would decrease with distance from the specific target arrays. For the proposed LZ, the action area includes the LZ plus a 350-foot buffer. This buffer accounts for potential aircraft rotor wash impacts on land adjacent to the proposed aircraft operations. Ground disturbance from hovering and landing/takeoff of aircraft could occur due to dust and debris being scattered and/or becoming airborne from aircraft rotor wash within this buffer (Bell Boeing 2008). The action for the OPs is defined as a very small area subject to on-foot traffic by one to a few Marines at any given time. In the analysis, each OP is considered to be a point within a 2-acre buffer.

Status of the Species and its Critical Habitat in the Action Area

Prior to this action, the only consultation conducted on desert tortoise within the action area was the 1996 programmatic biological opinion (Service 1996), which this consultation amends. No take has been reported under the programmatic to date.

Species Abundance in the Action Area

The biological assessment states that desert tortoises are known to occur throughout the action area, which lies entirely within the Chuckwalla critical habitat unit. Habitat within the action area is largely undisturbed with the exception of the unpaved roads that provide access to various parts of the range. Protocol-level surveys for desert tortoise were conducted in the action area (Leidos 2014a) on March 12-14, 2014, in accordance with the *2010 Field Season Pre-project Field Survey Protocol for Potential Desert Tortoise Habitats* (Service 2010b; survey protocol). The survey protocol is designed to estimate animals with midline carapace length (MCL) greater than 160 millimeters (mm) based on the number of live animals observed. The total area surveyed was 279 acres. The survey area was divided into three distinct areas: 1) target area, 2) LZ, and 3) the three OPs, which align with proposed project components (Figures 4-1 to 4-3). The survey area ranged in elevation from 1437 feet in the southern portion of the target area to 1,657 feet at the northernmost OP. Temperatures during the surveys ranged from 66 to 87 degrees Fahrenheit. Creosote-white bursage desert scrub is the dominant habitat on the target area and LZ with desert dry wash woodland in the washes on the sites. The OP sites were dominated by creosote bush and brittlebush (*Encelia farinosa*). A detailed description of the methodology, physical environment, and findings are presented in the *Final Focused Desert Tortoise Survey Report for Target Complex Invader, Chocolate Mountain Aerial Gunnery Range* (Leidos 2014a), and *Final Biological Resource Survey Report for Target Complex Invader, Chocolate Mountain Aerial Gunnery Range* (in prep., Leidos 2014b).

Overall, habitat suitability within the survey area ranged from good to excellent with minimal human-

caused disturbance and no non-native plant species; however, evidence of military training activities with scattered ammunition and some off-road vehicle tracks, trash and debris was documented. No sign of reproduction (i.e., egg-shell fragments) or juvenile or neonate (i.e., hatchlings) tortoises were observed. In addition, few shell remains but no intact carcasses were documented; live desert tortoises appeared to be healthy.

Within the target area and buffer, 20 signs of desert tortoise were observed including 14 burrows, 1 scat, and 2 shell remains. In addition, 3 live tortoises were detected; all were inside burrows. There were no signs of juvenile or sub-adult age classes, or signs of reproduction within the target survey area.

Nine signs of desert tortoise were observed within the LZ survey area including 7 burrows and 2 scat. No carcasses or live desert tortoises or signs of juvenile or sub-adult age classes were observed.

Three signs of desert tortoise were observed within the OP survey areas including 1 scat and 2 burrows. The survey area was rocky with some flat areas that are not considered optimal desert tortoise habitat. Two of the sign occurrences (a burrow and a scat) were located outside the survey area boundary. These were within zone of influence transects for OP at 3940 feet from the target. Zone of influence transects are required by Service protocol (Service 2010b) when no sign is identified within a defined survey area.

Based on Service pre-project survey protocol, an estimated total of 8 adult desert tortoises may occupy the action area. This equates to an estimated adult tortoise density of 18.4 tortoises per square mile (about 7.1 tortoises per square kilometer). The *Draft Range-wide Monitoring of the Mojave Desert Tortoise: 2013 and 2014* (Service 2015) estimates a comparable 7.2 desert tortoises per square kilometer within the Chocolate Mountain sub-unit of the Colorado Desert Recovery Unit.

In addition to large desert tortoises, the project site likely supports juvenile desert tortoises (i.e., MCL ≤ 180 mm) and eggs. Estimating densities of juvenile desert tortoises is difficult because of low detection probabilities due to their small size and cryptic nature. However, based on a 4-year study of their population ecology, Turner *et al.* (1987) determined that juveniles accounted for 19 to 81 percent of the overall population. Using this range and the estimated number of seven large desert tortoises in the target and buffer areas, we estimate that these areas may support between 1 and 6 juveniles. We recognize that the survey data used for this estimate come from a limited number of studies and that population levels are constantly changing. We also recognize that because the number of large desert tortoises in the action area is an estimate, the estimate of the number of juveniles may be inaccurate; however, these estimates provide the best available data to establish a baseline for analysis.

In addition, we expect the project area to support desert tortoise eggs. Estimating the number of tortoise eggs is extremely difficult given that the eggs are buried beneath the soil surface. To estimate the number of eggs that could be present on-site, we used the mean clutch size of 5.38 eggs per clutch (Turner *et al.* 1986 in Service 1994b) and a mean number of clutches of 1.6 per female per year (Turner *et al.* 1984). Assuming a 1:1 sex ratio (Turner *et al.* 1984, Turner *et al.* 1987), up to 3 of the estimated 7 desert tortoises within the target and buffer areas may be reproductive females that together could produce approximately 26 eggs per year. Applying these assumptions [i.e., the sex ratio,

mean clutch size, and mean number of clutches per female per year are comparable to those observed by Turner *et al.* (1984)] to estimate the number of eggs in the target and buffer areas has an unknown but high level of uncertainty. Therefore, while we cannot calculate a precise estimate for the number of eggs that may be impacted by the proposed project, we use this estimate, which constitutes the best available information, for the analysis contained in this biological opinion.

Status of Critical Habitat within the Action Area

The biological assessment states that the entirety of the Target Complex Invader occurs within the Chuckwalla critical habitat unit and that the project would locally affect habitat through direct and indirect effects, such as impacts at targets sites and the introduction of weeds as a result of ground disturbance. While the project area supports all of the primary constituent elements, direct effects would be confined to a relatively small, localized area (i.e., 279.6 acres). Although various activities associated with military use, such as off-road vehicle use, occur in this area, the proposed action is not expected to appreciably diminish the primary constituent elements necessary to support the conservation function of the critical habitat unit overall.

EFFECTS OF THE ACTION

Direct Effects

Though project-related impacts may be relatively intense during the training exercises conducted twice a year, such impacts are minimized by implementation of the conservation measures identified in the Description of the Proposed Action section and have been considered when analyzing the activities below. Although we cannot predict the number of individuals that would be killed or injured because of multiple variables involved, including weather conditions and activity patterns of desert tortoises at the time of training exercises, we expect this number to be small (see the Environmental Baseline section above for the total number of desert tortoise found in the action area).

Establishment of Target

The targets will be placed near existing roads and affixed using a 7-ton flatbed truck and 4-wheel drive forklift. Before the placement of the targets, a baseline Operational Range Clearance will be conducted to ensure that the area is clear of any range debris or errant munitions debris. This would establish the baseline level of contamination and ensure the safety of the target crews. Once the survey is complete, the truck would utilize established roads adjacent to the target emplacement area. A 4-wheel drive forklift would off-load the targets from the flatbed of the truck and drive a short distance on a new unimproved service road to emplace the target at the established target grid/points. No grading or clearing would occur. Access to and within the target area is described below.

Any of the fixed-wing, rotary-wing, and tilt-rotor aircraft that currently operate within the CMAGR [including but not limited to JSF³, F/A-18C/D,⁴ AV-8B, AH-1W, MV-22] could use the target area for air-to-ground delivery with conventional live high-explosive ordnance including precision-guided (i.e., GPS-guided) ordnance. The proposed target would primarily be used as part of the WTI training exercises, which occur twice per year around April and September.

Desert tortoises are typically underground during the hottest parts of summer to conserve water, and they brumate (i.e., go into a hibernation-like state during very cold weather) underground during most of the period between November and March. From March to October, desert tortoises emerge to forage in the morning and late afternoon, with most activity occurring in March and April (USGS 2004). Desert tortoises will also emerge from their burrows following summer rain events.

Implementation of conservation measures 1 through 14 will ensure that impacts to desert tortoises within the target area are avoided and minimized to the extent possible. In particular, CM 8 (Clearance Surveys during Initial Target Placement) was designed specifically to address potential impacts during this phase of the proposed action.

Target Area

The primary causes of injury or mortality to desert tortoise associated with operations and maintenance of the proposed target area would include direct impacts from ordnance, conflicts with vehicles, the associated damage or destruction of burrows, and habitat degradation. The total amount of habitat expected to be directly impacted is approximately 103 acres within the 279.6-acre action area. The potential for mortality or injury would be highest during training exercises conducted during the active season for desert tortoise (i.e., when desert tortoises are most likely to be above-ground). Although ordnance delivery could occur anywhere within the safety arc (including misses), the focus of the training and thus resulting disturbance potential would be at or near specific target locations, and the likelihood of direct impact from ordnance would decrease with distance from the targets.

Conflicts with vehicles used on existing maintenance roads or travel off-road to retrieve ordnance debris during operational range clearance and target maintenance activities may result in mortality or injury to desert tortoises; however, the level of use is not expected to substantially increase beyond currently authorized levels. Desert tortoises that are moved from harm's way within the action area may be affected by physical stress of the relocation and by associated stresses, such as loss of bodily fluids caused by voiding urine.

Continued operations at the target site would degrade desert tortoise habitat over time. Impact craters and debris from bombs and other ordnance would damage vegetation and soil surfaces and increase the

³ JSF does not currently employ the use of live ordnance during training activities within the CMAGR. However, the future use of live ordnance within training ranges at the CMAGR will occur on approved attack/delivery profiles similar to other fixed-wing aircraft currently operating within the CMAGR. This use was approved as part of a separate NEPA action.

⁴ Incorporation of the JSF aircraft into the training environment at the CMAGR began in 2013–2014 with the number of sorties expected to increase over time. Because the JSF is the replacement aircraft for the phasing out of the F/A-18 and AV-8B, a commensurate decline and eventual cessation of training with the F/A-18 and AV-8B is expected.

potential for weed establishment. Removal of native vegetation may leave individual desert tortoises vulnerable to thermal stress in the absence of shrub cover as well as predation by species attracted to human activity such as ravens or coyotes (*Canis latrans*). Also, increases in non-native plant species densities could permanently alter existing plant communities and result in unnatural fire return intervals.

Desert tortoise may further be affected by noise and ground disturbance generated from gunnery or explosive ordnance activities, and low-level subsonic or supersonic aircraft flights. Noise could elicit temporary behavioral responses by desert tortoises or could possibly affect hearing thresholds. Specific effects of increase noise levels on desert tortoise are not known. However, noise and vibration generated by off-highway vehicles have caused physical damage and behavioral modification in other desert species, such as the desert kangaroo rat (*Dipodomys deserti*), Mojave fringe-toed lizard (*Uma scoparia*), and Couch's spadefoot toad (*Scaphiopus couchi*) (Brattstrom and Bondoello 1983). It is likely that desert tortoises are also subjected to some physical damage and stress from these impacts; however, whether or not individuals habituate to various noise levels is unknown.

Soil compaction from vehicle traffic and ordnance explosions could also make it difficult or impossible to dig burrows within the target area or to practice geophagy, in which soils are eaten perhaps to augment the desert tortoise's calcium levels (Marlow and Tollestrup 1982). Because of the infrequency of training activities, dust generation due to ordnance delivery would have a minor adverse impact on plant productivity but may result in a minor reduction in available forage and cover within the target area.

The biological assessment states that according to Service protocol surveys and calculations conducted for the proposed action (Leidos 2014b), 8 subadult and/or adult desert tortoises may occur in the 279.6-acre action area including buffers. Based on a ratio of each of the project areas to the action area and assuming an even distribution, the 99-acre target area would support approximately 3 desert tortoises. The 153.5-acre buffer area would support 4 desert tortoises. The target area plus buffer area would sustain virtually 100 percent of impacting ordnance (including misses), but desert tortoises in the buffer area would be much less likely to be affected by ordnance delivery than those in the target area. It is assumed that almost all munitions impacts would occur within 30 meters of an individual target due to the precision munitions being employed, which equates to approximately 10 percent of the target area. The biological assessment submits that given 10 percent of the target area would be directly disturbed by munitions, it could be assumed that there could be a 10 percent chance of one tortoise being injured within the target area during the year or a 30 percent chance for take of three desert tortoises. This would amount to take in the form of capture, injury, and/or mortality of 0.3 desert tortoises per year.

The biological assessment states that desert tortoises in the 153.5-acre buffer area could be affected by vehicles and personnel accessing the target area twice annually for target repair and cleanup of debris and unexploded ordnance. The buffer area could also be affected very infrequently by ordnance (misses) leading to a small potential for injury/mortality and incrementally impacting available resources. The biological assessment estimates that there would be a 1 percent or less chance of injury or mortality to the four desert tortoises in the buffer area in any given year.

However, because desert tortoises within the target area will not be translocated prior to training activities and based on the uneven distribution of desert tortoises across the landscape, the mobility of the species, the size of their home ranges, and the data provided in the project-specific surveys, the worst-case scenario is that the three desert tortoises estimated in the target area will be killed by training activities. Additionally, because the target area will not be fenced, animals in the adjacent buffer area or that occupy overlapping home ranges are likely to utilize the target area. Therefore, the four desert tortoises estimated in the buffer area may also be at risk of mortality from training activities. Using long-term monitoring data, the Service calculated the estimated adult (i.e., MCL \geq 180 mm) densities in 2014 as well as the change in abundance within desert tortoise conservation areas (see Service 2011a, Box 2 and Figure 2) in each recovery unit between 2004 and 2014 based on multi-year trends from the best-fitting model describing log-transformed Mojave desert tortoise density per square kilometer (Service 2015). An estimated density of 7.2 desert tortoises per square kilometer was calculated for the CMAGR in 2014. Estimated abundance in 2004 was 7,327 and 5,146 in 2014. This is a change of -2181 large animals over the past decade. Despite the apparent declines in the species range-wide (see Service 2015), the loss of up to seven desert tortoises over the course of operations from the target and buffer areas as a result of not being translocated is unlikely to affect, in an appreciable manner, the long-term productivity of desert tortoises in the Colorado Desert recovery unit.

An unknown number of eggs may be destroyed by training activities in the target area. Most desert tortoises lay eggs from late May through July, although some nest as late as October. Most eggs hatch from mid-August through October, although some eggs may remain over winter. For the purposes of this analysis, we will assume that all eggs within the action area will be destroyed and that this loss comprises the entire breeding season of the 8 desert tortoises in the action area. The loss of eggs from this small number of desert tortoises is unlikely to have a measurable effect on population trends of desert tortoises in the Chuckwalla critical habitat unit for three reasons. First, the number of female desert tortoises on the proposed target range and buffer on the CMAGR is a small fraction of the number of females within the critical habitat unit. Second, many nests are destroyed by predators; consequently, not all eggs hatch. Third, as we discussed with regard to hatchling desert tortoises, only a small percentage of hatchlings survive until reproductive age. Therefore, the loss of eggs from those desert tortoises in the action area is unlikely to have a measurable effect on the population trend of desert tortoises on the CMAGR or in the critical habitat unit.

As stated above, implementation of the conservation measures are expected to reduce impacts to desert tortoises within the action area. Measure 10 (Tortoise Monitoring during Service Road Construction, Target Repair, and EOD Clearance Activities) will be essential to avoid and minimize impacts during maintenance of the targets and other project components.

Landing Zone

The survey area for the proposed 2.4-acre LZ includes a 350 foot buffer, which is designed to be inclusive of all likely effects from rotary wing and tilt-rotor operations (Bell Boeing 2008). The area of the LZ including the 350-ft buffer is 21.4 acres. Desert tortoises on the surface could be affected by noise, rotor wash, landing gear, or personnel associated with aircraft landings. Desert tortoises are generally above ground and active during spring and late summer/early fall, and are typically

underground during the hottest parts of summer to conserve water as well as during the winter months. However, desert tortoises will come out of their burrows to access water after rain events during the monsoonal summer months. Although WTIs would occur during the highest activity period, individual aircraft operations have a low probability of directly affecting desert tortoises given the small footprint of the aircraft LZ, the uneven distribution of individual desert tortoises in the project area, and overall abundance in this region (estimated to be 18.4 individuals per square mile or 7.1 tortoises per square kilometer) (Leibos 2014b).

Potential direct effects on desert tortoise that may result from training use of the LZ would include injury or mortality from impacts from air or ground equipment and crushing of occupied burrows. Training activities would result in temporary increases in noise, downdraft, dust, and presence of aircraft during landing, low-altitude hovering, and takeoff operations. Changes of only a few decibels have been shown to elicit substantial behavioral response in other animals, but only limited data exist relative to effects of noise specifically on desert tortoises (Bowles *et al.* 1999). Desert tortoises are expected to resume normal activities following departure of the aircraft from the immediate area. Water balance and energy balance are expected to be unaffected. Increased dust and disturbance, noise, and activity would be temporary and occur over a small area, with the majority of use occurring twice per year during individual two-week periods.

The biological assessment estimates that 1 desert tortoise may occur in LZ and associated buffer, and that the potential for direct injury or death is expected to be low. In the LZ, disturbance may affect up to 2 tortoises in response to rotor wash or foot traffic, assuming that there would be up to 8 landings/takeoffs per year (four in Spring WTI and four in Fall WTI).

Observation Posts

The use and resulting potential effects at proposed OPs would be very low. Personnel would travel over land on foot to the OPs from the LZ and position themselves as part of the training exercises. Individual desert tortoises are unlikely to be affected; however, limited ground disturbance would occur along the ingress and egress paths to the OPs, similar to any pedestrian activity in desert tortoise habitat. Given the small overall footprint associated with the OPs and the types of activities proposed, the potential for injury or mortality is low and degradation of habitat may occur on a very small scale. It is unlikely that any take would result from use of the OPs.

Access Roads

Access to Target Complex Invader from the pavement of Route 78 is about 27 miles. Because the access roads are not fenced, desert tortoises that are moved out of harm's way have the potential to return to the point of capture, which would expose them to continued threat of injury or death. The access roads likely bisect numerous home ranges along their lengths, and desert tortoises would be most at risk during training operations twice a year when vehicles use the road to access the target area, LZ, and OPs. At other times of the year, the impacts are expected to be minor due to typically low traffic volumes.

In addition to the other conservation measures outlined herein, the speed limit requirement along this 27-mile route, CM 4 should reduce (but not eliminate) the likelihood of mortality because drivers are more likely to see desert tortoises when they are driving more slowly. Smaller desert tortoises would be at the greatest risk of being struck by vehicles because they are more difficult to see. Also, any road-killed wildlife species will be buried to minimize attraction of ravens and other desert tortoise predators.

Indirect Effects

Common Ravens

We cannot predict the amount of predation by common ravens that the proposed action is likely to add to baseline levels within the action area. Raven populations are relatively low in the Chuckwalla critical habitat unit and no raven predation has been documented on the CMAGR. We anticipate that conservation measures proposed to control trash and other waste are likely to be effective in reducing the attractiveness of the project area to common ravens.

The regular vehicle traffic on access roads is likely to kill wildlife. If this mortality becomes a regular occurrence, common ravens would likely frequent the area to feed on the carcasses. Scavenging would increase the number of common ravens, first by drawing in the initial birds and then by providing a food subsidy that would lead to an overall increase in abundance of common ravens as they are able to raise more young. We cannot predict the degree to which vehicular use on the access road would result in these adverse effects. The MCASY has not proposed any measures to respond to such an occurrence.

CM 7 (Waste Management) and CM 13 (Raven Management), together with the other conservation measures, are expected to reduce impacts to desert tortoises from ravens. Implementation of these conservation measures is essential to ensure that the baseline population of ravens on the CMAGR does not increase, posing a greater threat to desert tortoises on the range.

Non-native Plants and Wildfire

Development of the target complex may introduce or spread non-native, potentially invasive plant species into habitats on and adjacent to the project site. Project activities may increase distribution and abundance of non-native species within the action area due to ground-disturbing activities that favor these species. In addition, project equipment may transport nonnative propagules into the project area where they may become established and proliferate.

Non-native species provide inferior forage opportunities for desert tortoises (Service 2011b), may out-compete native species, and change the seasonal availability of forage necessary to tortoises to meet their nutritional requirements. Also, introduction of non-native plants may lead to increased wildfire risk, which ultimately may result in future habitat losses (Brooks 2003). *Buffel grass* (*Cenchrus ciliaris*) is an invasive species that is becoming more of a concern in the California deserts and has the potential to enter the action area on equipment coming from adjacent states.

Although uncommon in desert areas, wildfires caused by ordnance may degrade or destroy desert tortoise habitat by removing native food sources, further spread invasive weeds, thereby increasing fire frequency. Many of the dominant desert species are slow to recover from fire and large fires could fragment desert tortoise habitat and recurrent fires may reduce the abundance and diversity of native forbs, which are the major food source of the desert tortoise. Proliferation of non-native plant species after an exceptional rainy season caused fires to spread through large areas of critical habitat in the Mojave Desert during 2005 but there was no burning recorded in the Colorado Desert during that time (Service 2008, Table 1).

We cannot predict the degree to which non-native species would proliferate within or spread beyond the boundaries of the action area for several reasons. For example, above-average rainfall immediately after disturbance may encourage the spread of weeds whereas drought may have the opposite effect. We cannot predict whether project equipment would introduce new species or whether such new species would be able to germinate, grow, and reproduce on-site. Because the objective of CM 12 is to ensure that the spread of invasive species is controlled, we predict that the proposed project would not lead to an increase in the number or abundance of non-native species. Additionally, based on the type of training activities proposed and the implementation of the conservation measure that requires a fire prevention and management plan to be in place, the potential for wildfire is considered low.

Implementation of Measures Proposed to Avoid, Minimize, and Compensate for Project Impacts (Conservation Measures)

As discussed in part above, implementation of the conservation measures associated with the proposed action would minimize impacts to desert tortoises from the establishment, operations, and maintenance of the target, LZ, and OP for the life of the project. All personnel will be required to participate in a Tortoise Education Program (CM 2), check under vehicles for desert tortoises prior to moving their vehicles (CM 5), and speed limits will be limited to 20 miles per hour within designated critical habitat (CM 4), resulting in personnel being less likely to strike desert tortoises on roads accessing the project components. Because the access roads would not be fenced, desert tortoises that are moved out of harm's way from the work area have the potential to return to the point of capture, which would expose them to continued threat of injury or death. The presence of authorized biologists and biological monitors and speed limit requirements should substantially reduce this risk.

Clearance surveys for the initial target placement will be performed (CM 8) to minimize direct impacts to the species during this phase of the project. Biological monitors will be on-site during service road construction, target repair, and EOD clearance activities (CM 10) whenever these actions are required. All other conservation measures, including the presence of a desert tortoise management representative (CM 1), reporting of conflicts with or take of desert tortoises (CM 3 and CM 11), pet prohibitions (CM 6), waste and raven management (CM 7 and CM 13, respectively), and invasive plant species control (CM 12) will also be implemented throughout the life of the project. Finally, the action area will be integrated into the rotation of ranges that are currently surveyed during annual surveys at the CMAGR (CM 9); the results of these surveys will be submitted to the Service before January 15 of each year.

The presence of a tortoise management representative and biological monitor(s) (CM 1) will ensure that the avoidance and minimization measures that are a part of the proposed action and this biological opinion are implemented and corrective actions are taken should any non-compliance be documented. Any desert tortoises in harm's way would be allowed to move off-site on their own or be moved by a qualified appointee (CMs 5, 8, and 10). Handling desert tortoises sometimes causes them to void the contents of their bladder, which may represent loss of important fluids that could be fatal (Averill-Murray 1999 in Boarman 2002). Averill-Murray 1999 (in Boarman 2002) provided some evidence that handling-induced voiding may adversely affect survivability, although the amount of fluid discharged is usually small. However, because only experienced biologists (i.e., authorized biologists) approved by the Service and approved handling techniques will be used, collected desert tortoises are unlikely to experience substantially elevated stress levels, or be killed or injured.

Effects on Recovery

The 2011 revised recovery plan for desert tortoise (Service 2011a) identifies the following three recovery criteria for use in determining when it may be appropriate for delisting:

1. Rates of population change for desert tortoises are increasing over at least 25 years (a single tortoise generation), as measured by extensive, range-wide monitoring across tortoise conservation areas within each recovery unit and by direct monitoring and estimation of vital rates (recruitment, survival) from demographic study areas within each recovery unit.
2. Distribution of desert tortoises throughout each tortoise conservation area is increasing over at least 25 years.
3. The quantity of desert tortoise habitat within each tortoise habitat conservation area is maintained with no net loss until tortoise population viability is ensured.

A total of 8 large desert tortoises are estimated to occur within the action area; as discussed above, these individuals are not integral to maintaining a stable or increasing desert tortoise population. Access roads are expected to disturb a small fraction of intersected desert tortoise home ranges, and desert tortoises along linear components would not be displaced from their home ranges. Consequently, the proposed action will not affect the ability to achieve criterion 1.

Because of the relatively small project footprint, the proposed action is not likely to affect the expansion of regional desert tortoise distribution within the Chuckwalla critical habitat unit.

While the project may result in a net loss of habitat due to impacts from training activities, the loss is negligible relative to the size of the recovery unit/critical habitat unit. Therefore, the proposed action likely would not adversely affect the ability to achieve criterion three. Given all of the above, we conclude that the proposed action is not likely to significantly impair the recovery of desert tortoise.

Effects on Critical Habitat

The entirety of the action area (279.6 acres) is located within the Chuckwalla critical habitat unit for the desert tortoise. Habitat within the action area is largely undisturbed with the exception of the unpaved roads that provide access to various parts of the range. In the following paragraphs, we consider the effects of the proposed action on the primary constituent elements of desert tortoise critical habitat.

Sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow

Approximately 40 percent of the CMAGR overlaps the Chuckwalla critical habitat unit. The approximate acreage of designated critical habitat on CMAGR is 187,046 ac (Service 2008), which constitutes about 18 percent of the overall acreage of the Chuckwalla critical habitat unit. An estimated 2,095 acres are occupied by target areas and an additional 161 acres are occupied by forward arming and refueling points on the range (Service 2008). Because the target complex is localized within an area less than 280 acres including buffers (0.1 percent of the critical habitat on the CMAGR), most of those lands would be minimally impacted (i.e., the buffer areas), the site will not be fenced allowing continued access by resident desert tortoises, and the site would only be used twice a year, the disturbance of 279.6 acres would not have a measurable effect on the ability of the critical habitat unit to support viable populations or to provide for movement, dispersal, and gene flow.

Sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; Suitable substrates for burrowing, nesting, and overwintering; Burrows, caliche caves, and other shelter sites; and Sufficient vegetation for shelter from temperature extremes and predators

The second through fifth primary constituent elements represent the plant species desert tortoises require for food and shelter, the substrates necessary for these plants to grow and for desert tortoises to construct burrows, and the burrows and other shelter sites they use. These features are the components of the environment necessary to meet desert tortoise's need for food and shelter. Because the condition of substrates, annual forage species, and perennial shrubs are so interrelated, we have combined our analysis of the effects of the proposed action on these primary constituent elements.

The action area supports all of the primary constituent elements for desert tortoises and is relatively undisturbed. The establishment of the target area would not purposefully remove any habitat; however, degradation would result from ordnance delivery, operational range clearance, and target maintenance activities and the associated disturbance of surface materials. Impact craters and debris from bombs and other ordnance have the potential to locally remove or alter the plant composition. However, consistent with similar military-type operations in the CMAGR, effects would be localized and their loss would not compromise the ability of the local area to provide these needs to desert tortoises. That is, the surrounding habitat would continue to support suitable substrate for annual plants and burrows, and shrubs for cover.

The greater concern with these primary constituent elements lies in the potential for the spread of non-native, invasive plants species, first within the action area, then over time, into surrounding habitats. As we discussed in the Effects on Desert Tortoises section above, non-native weedy species can form dense concentrations of plants that allow wildfires to spread. Desert scrub communities are not adapted to fire; a fire would likely kill most shrubs in the area and lead to increased colonization by non-native, invasive weeds. In such an event, the native annual species that desert tortoises require for food and the shrubs upon which they depend for cover would decrease in abundance and impair the ability of critical habitat to serve the conservation functions of the second and fifth primary constituent elements (i.e., sufficient quality and quantity of forage species and sufficient vegetation for shelter from temperature extremes and predators).

Additionally, weedy species can out-compete native species and thereby reduce the abundance and diversity of the native species upon which desert tortoises depend. Oftedal's work (2002 in Service 2010b) demonstrates that invasive weeds may adversely affect the physiological health of desert tortoises because they do not contain the same types and levels of nutrients of native plants; desert tortoises that are undergoing nutritional stress may be more susceptible to diseases, drought, and predation. Therefore, a proliferation of nonnative invasive species would impair the conservation function of the second primary constituent element (i.e., sufficient quality and quantity of forage species). However, consistent with the discussion above, we anticipate that CM 12 would effectively control the potential spread of non-native invasive species.

Habitat protected from disturbance and human-caused mortality

The programmatic biological opinion for military activities at the CMAGR concluded that activities associated with target areas and other training were not likely to result in the significant destruction or adverse modification of designated critical habitat for desert tortoise (Service 1996). In aggregate, military use within the CMAGR since the issuance of the 1996 biological opinion has resulted in low to negligible levels of habitat disturbance. Nonetheless, direct impacts to designated critical habitat from the proposed action would include physical disturbance to the ground surfaces, vegetation communities, and surface drainages. Indirect effects from training activities could extend beyond the target area and buffers; however, the habitat disturbance associated with military training is focused within a small area and is infrequent in nature, primarily coinciding with the bi-annual WTI typically in April and September. Although disturbance and human caused mortality could occur and impacts to habitat will result, the scale and duration of these disturbances would be relatively minor. Additionally, the military land use designation, which restricts public access to the range, incidentally benefits the desert tortoise and its habitats within the CMAGR boundary and aids in the protection of designated critical habitat from unauthorized disturbance and human-caused mortality.

CUMMULATIVE EFFECTS

Cumulative effects include the effects of future State, local, tribal, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. At this time the Service is not aware of any reasonably certain to occur, future, non-Federal actions.

CONCLUSION

Desert Tortoise and Critical Habitat

After reviewing the current status of the species and its designated critical habitat, environmental baseline for the action area, effects of the proposed action, and cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the desert tortoise or destroy or adversely modify designated critical habitat to the extent that the survival and recovery of desert tortoise would be appreciably reduced because of the small and localized effects of the action. We base this conclusion on the following:

1. Direct impacts from the proposed action would impact a negligible amount (less than 0.0002 percent) of desert tortoise habitat in the recovery unit.
2. Few desert tortoises are estimated in the action area; therefore, incidental take from the proposed action would be minimal.
3. Because conservation measures will be implemented to ensure impacts from the proposed action are avoided and minimized, impacts to desert tortoises and its habitat will be minimized. Any desert tortoises encountered while establishing the targets and other ancillary components would be avoided.
4. Use of access roads likely does not represent a long-term impediment to habitat connectivity because of the low levels of use expected for operations and maintenance activities.
5. The Chuckwalla critical habitat unit, 1 of 12 designated critical habitat units across the species' range, totals approximately 1,020,600 acres (Service 1994a). Direct impacts from the proposed action would impact a negligible amount (less than 0.0002 percent) of the unit. Moreover, because conservation measures will be implemented to ensure impacts from the proposed action are avoided and minimized, impacts to the primary constituent elements identified for desert tortoises also will be minimized.

INCIDENTAL TAKE STATEMENT

Overall, we expect death and injury of large desert tortoises to be avoided during establishment and maintenance of the target complex through implementation and compliance with the conservation measures identified as part of the proposed action. However, because juvenile desert tortoises and eggs are difficult to detect, surveyors may overlook most of them during clearance surveys and monitoring, leaving these life stages susceptible to death and injury. Based on the calculations performed for the environmental baseline section, we estimate that as many as 6 juvenile desert tortoises may occur within action area. We also estimate that reproductive females on the project site may produce up to 26 eggs per year. Because the estimate for the number of eggs is for total annual production, we cannot predict what portion of this total will be present on-site during establishment, operations, and

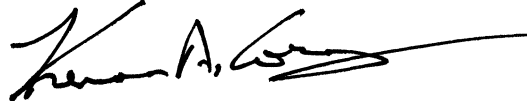
maintenance activities; as a result, we cannot estimate how many eggs would be destroyed by the proposed action. Additionally, desert tortoises in all life stages will be susceptible to injury and mortality within the target area during training activities because translocation of individuals on-site and fencing of the area are not included as part of the proposed action.

The 1996 programmatic biological opinion exempted take in the form of injury or mortality of 11 desert tortoises and capture/harassment of 112 animals annually, across the CMAGR (Service 1996). Estimated take of large desert tortoises associated with the Target Complex Invader (seven over the course of operations) falls within the threshold previously established. No take has been reported in recent years under the programmatic biological opinion; thus, the incremental amount of estimated take associated with the proposed action is not likely to exceed take limits set forth in 1996.

The nature of the proposed action is similar in scope to the activities previously addressed in the programmatic biological opinion (Service 1996), and it includes all conservation measures identified for the original action. The measures described in the 1996 programmatic biological opinion as well as the additions and revisions included herein are non-discretionary; the CMAGR and/or its contractors must adhere to them for the exemption in section 7(o)(2) to apply. If the CMAGR fails to implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of the incidental take, the CMAGR must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 Code of Federal Regulations 402.14(i)(3)).

If you have any questions, please contact Jody Fraser of my office at jody_fraser@fws.gov or (760) 322-2070, extension 207.

Sincerely,

A handwritten signature in black ink, appearing to read "Kennon A. Corey", with a long horizontal flourish extending to the right.

Kennon A. Corey
Assistant Field Supervisor

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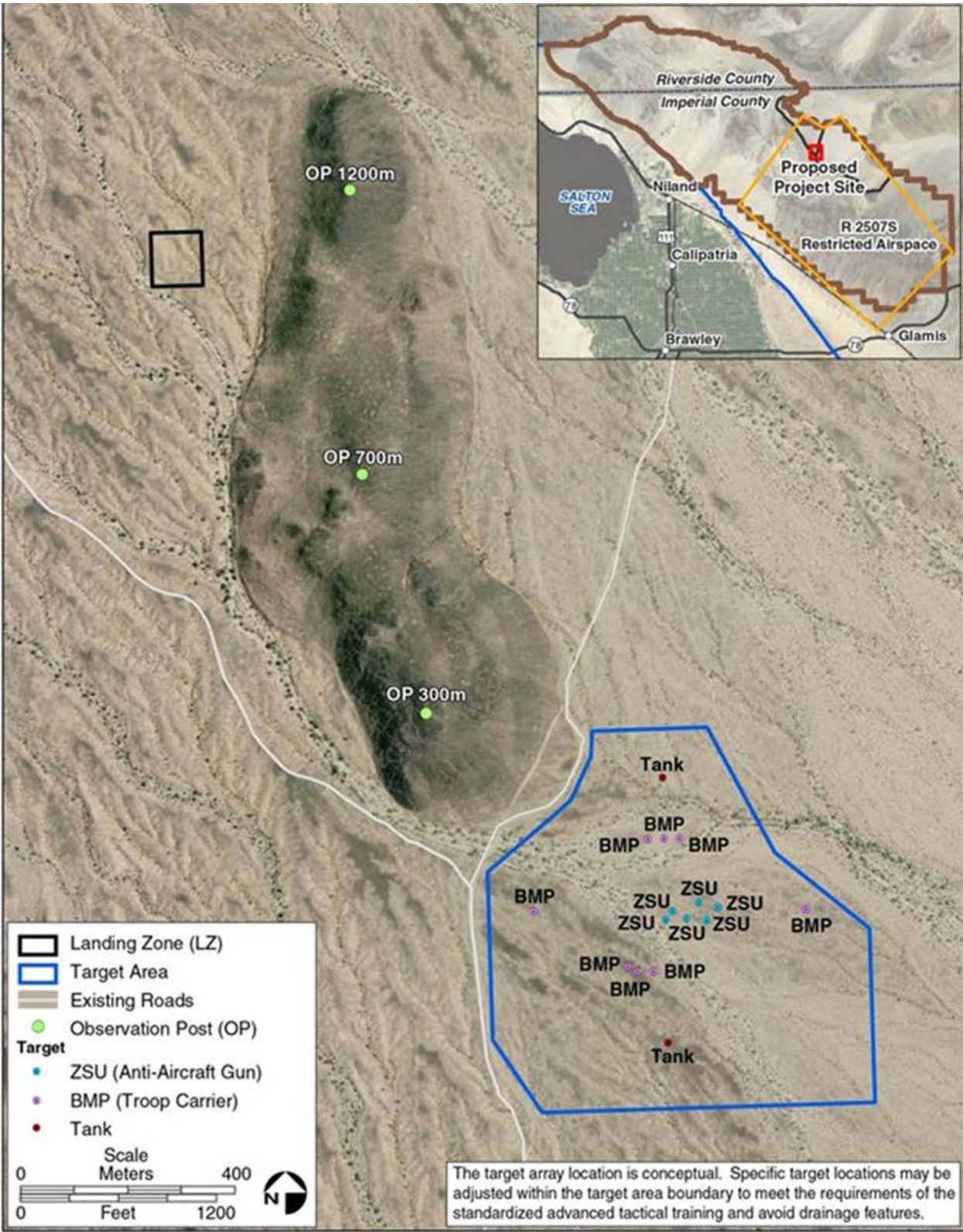


Figure 1. Regional perspective and conceptual layout of the Target Complex Invader.

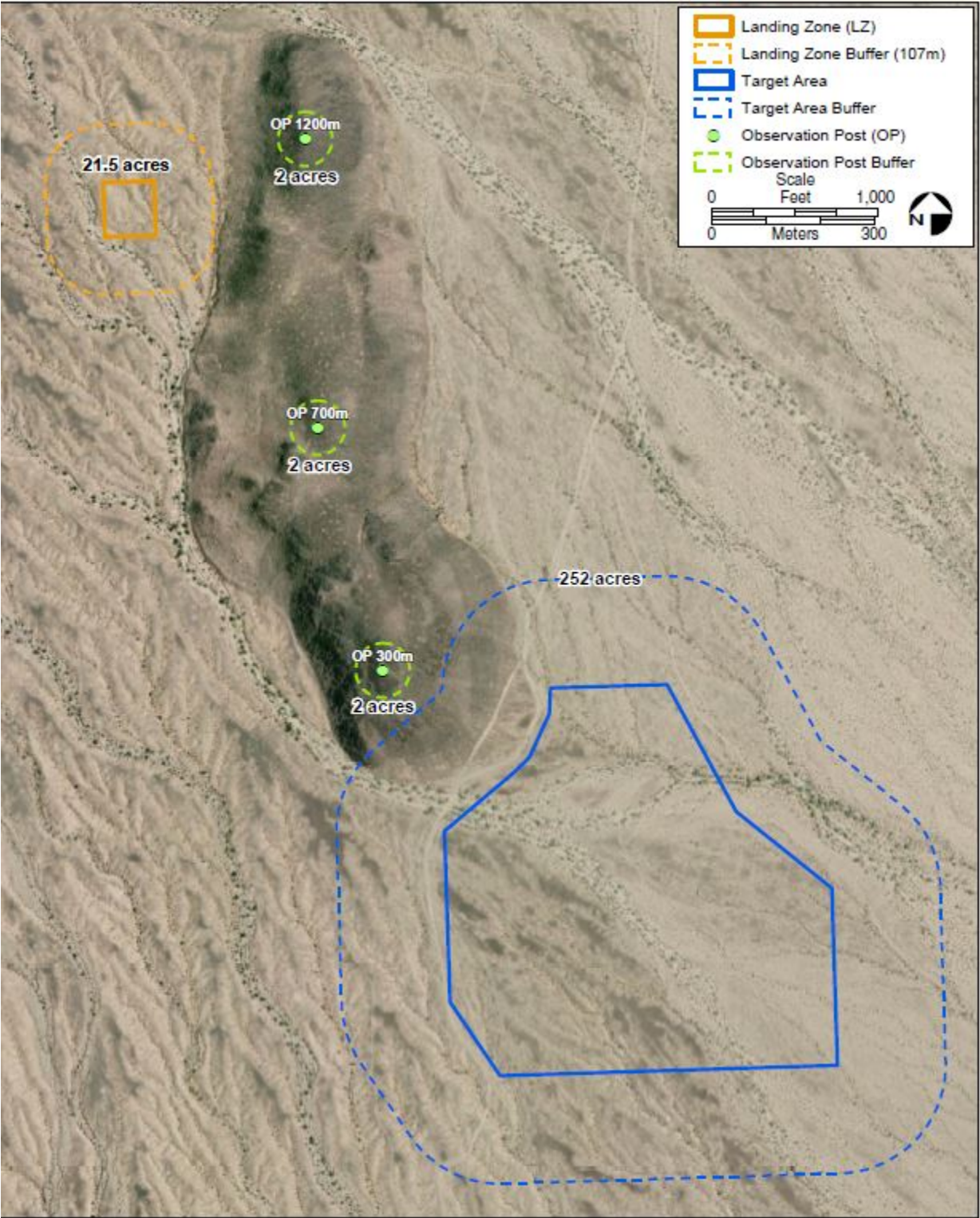


Figure 2. Target Complex Invader components with buffer areas.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, California 92008

April 18, 1996

Major J.D. Cox
Director, Range Management
U.S. Marine Corps
Marine Corps Air Station
Box 99100
Yuma, Arizona 85369-9100

Re: Biological Opinion for the Military use of the Chocolate Mountain Aerial Gunnery Range, California (1-6-95-F-40).

Dear Major Cox:

This Biological Opinion responds to your request for formal consultation with the Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act). The Marine Corps Air Station, Yuma (MCAS, Yuma) request was dated July 5, 1995, and was received by our office on August 17, 1995. At issue are the effects of all existing and proposed military use activities of the Chocolate Mountain Aerial Gunnery Range, California (Range), on the federally listed threatened desert tortoise (*Gopherus agassizii*).

This Biological Opinion was prepared using the following information: 1) Desert Tortoise Survey Results, Chocolate Mountain Aerial Gunnery Range, Yuma Training Range Complex, Marine Corps Air Station Yuma (Dames & Moore 1994); 2) Biological Assessment for the Desert Tortoise for the military use of the Chocolate Mountains Aerial Gunnery Range, California (BA) (Dames & Moore 1995); 3) draft Yuma Training Range Complex Environmental Impact Statement (EIS) (May 1994); and 4) other materials contained in our files.

BIOLOGICAL OPINION

It is the opinion of the Service that the proposed project is not likely to jeopardize the continued existence of the desert tortoise, nor is it likely to result in the significant destruction or adverse modification of critical habitat for the desert tortoise.

DESCRIPTION OF THE PROPOSED ACTION

The Range is located in north-central Imperial County and south-central Riverside County, California. The Range encompasses approximately 387,200 acres (605 square miles). It is bound on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde Mountains. The northern border is separated from the Orocopia Mountains by Salt Creek and includes part of the Chuckwalla Bench. From the northern border, the Range extends south to State Route 78 near Glamis. A map of the Range is included at the end of this document.

The primary function of the Range is to provide realistic targets for training Marine and Naval aircrews in the tactics of air-to-ground attack.

Current Activities

Current on-going activities occur on five Close Air Support (CAS) target ranges, a Rockeye munitions range, and 31 other individual targets dispersed throughout the Range. Fifteen of the individual targets are within, or in close proximity to the CAS ranges. There are 9 observation posts, 11 ground support areas, and 11 sites designated as artillery firing positions.

CAS is the tactic of delivering ordnance from aircraft in near proximity to friendly forces. Rockeye munitions are cluster bombs composed of hundreds of individual bomblets enclosed in a larger bomb case that bursts over the target to distribute the bomblets over a broad area before they detonate. The individual targets are used by aircraft for delivering ordnance with no CAS activities. The total area of the CAS ranges and Rockeye munitions range combined is about 15,360 acres (24 square miles). The 16 individual targets outside of CAS range areas combined cover less than 2560 acres (4 square miles).

Observation posts are positions where forward air controllers direct air strikes onto targets. Ground support areas vary in size, but most are less than 249.6 acres (0.39 square mile). The 11 ground support areas, average 250 acres each, and total approximately 2,746 acres. Ground support areas are used interchangeably as base camps for Forward Arming and Refueling Points, mobile radar, communications, and anti-aircraft missile sites. All of these support areas are located adjacent to established roads. The 11 artillery sites are used to fire spotting rounds into the Iris Pass, Punch Bowl, or Deadman CAS ranges to mark targets for air strikes. Spotting rounds are artillery shells containing white phosphorous, that burn on impact to provide a bright plume of white smoke to mark enemy positions for aircrew attack. No acreage was provided for observation posts or artillery sites in the BA.

Ordnance delivery by fixed-wing aircraft is authorized at Dead Man, Irish Wash, Punch Bowl, and Blue Mountain CAS ranges. Mount Barrow is restricted to ordnance delivery by helicopter. Currently only inert ordnance may be delivered within Range area underlying R-2507N southwest of a line running along the axis of the Chocolate Mountains. Inert and live ordnance may be used throughout R-2507S.

SEALs training by Naval Special Warfare Group-1 (NSWG-1) is also conducted on the

Range. NSWG-1 operates Camp Billy Machen, a training camp located near the southwestern boundary of the Chocolate Mountain Range. SEAL training areas include Training Areas 1 and 2, Firing Zones 1 and 2, and a Fast Attack Vehicle (FAV) driving course. Training Area 1, excluding Firing Zone 2, is approximately 80,000 acres (125 square miles), Training Area 2, excluding Firing Zone 1, is about 29,440 acres (46 square miles). Firing Zones 1 and 2 are about 32,640 acres (51 square miles). SEAL training involves activities such as combat on foot, light vehicle use, parachute drops, and insertions/extractions.

The current ground use, excluding roads, encompasses at least 16,2746 acres of the 387,200 acre Range. Almost one half of these current activities occur in desert tortoise critical habitat (See Maps 1 & 2).

Proposed Activities

The proposed activities for the Range include an increase in net explosive weight limits, night attack training, live ordnance authorization, target development, relocation of training support areas, and relocation of NSWG-1 training activities.

Current net-explosive weight limits for air-to-ground ordnance delivery are 2,000 pounds per bomb and 3,000 pounds total for all bombs released per aircraft pass in fixed-wing aircraft. The proposed action is to increase these weights to 12 MK 82(500 pound) bombs, 6 MK 83(1,000 pound) bombs, or 4 MK 84(2,000 pound) bombs per aircraft pass.

The proposed action also includes implementation of night ordnance delivery training between 2200 and 0600 hours. (Currently training is permitted between 0600 and 2200 hours only.) Another proposal is to authorize R-2507N section for possible future live ordnance. Three new individual targets are proposed for development as well as redeveloping seven inactive individual target sites in R-2507N.

Currently two ground support areas and a parachute drop zone are located outside of the southern end of the Range boundaries. The proposed action also includes the relocation of these activities to new on-Range positions and the creation of an additional parachute drop zone.

Training Area 1 and Firing Zones 1 and 2 are proposed for closure. Training Area 1 lies in desert tortoise critical habitat. If Training Area 1 closes to SEAL activity, ground activity will be eliminated in 80,000 acres of desert tortoise critical habitat. To continue NSWG-1 training within the Range, further development is proposed for Training Area 2, which will be renamed, "Special Warfare Training Area 4". Existing operations on the current FAV course will be modified to limit use along the Coachella Canal. Use of the FAV course along Salt Creek, the Bradshaw Trail, and the Nyland-Blythe Road is being eliminated.

More detailed descriptions of current and proposed activities in the Range can be found in the BA and draft EIS.

Measures proposed by the MCAS, Yuma to reduce potential impacts to desert tortoise from training activities are as follows:

1. MCAS, Yuma will designate a tortoise management representative within the Range Management Department whose duty will be to ensure compliance with protective stipulations by all users of the Range. This representative will have the authority to halt activities that may be in violation of such provisions. The tortoise management representative also will coordinate with the designated Service representative on all matters concerning desert tortoise mitigation and management responsibilities.
2. All ground users of the Range will participate in a tortoise education program. MCAS, Yuma will develop the educational program, including a video, for the Range users. The educational program will be developed cooperatively with the Service. The program will include, at a minimum, the following topics: 1) occurrence of desert tortoises; 2) sensitivity of the species to human activities; 3) legal protection for desert tortoises; 4) penalties for violations of federal laws; 5) general tortoise activity patterns; 6) reporting requirements; 7) measures to protect tortoises; and 8) personal measures that users can take to promote the conservation of desert tortoises.
3. All users of the Range will be informed of their responsibility to report any form of take to the tortoise management representative.
4. Explosive Ordnance Disposal (EOD) personnel will be responsible for periodically reminding all escorted Range users of the prohibitions regarding off-road vehicular travel and other protective measures for tortoises.
5. All personnel operating vehicles within tortoise habitat on the Range will inspect underneath their parked vehicle, prior to moving it. If a desert tortoise is found beneath the vehicle, the tortoise management representative, or qualified appointee(s), will be contacted to remove the animal from harms way.
6. No pets will be permitted at anytime within desert tortoise habitat. Military working dogs will be permitted, under control of their handler.
7. All ground personnel that enter the Range will be required to remove all food stuffs, trash or other waste that may attract predators. Any trash receptacles used for extended stays will be equipped with latching/locking lids.
8. All roads entering critical habitat will be posted with speed limits of 20 miles per hour.
9. Clearance surveys conforming to Service recommendation will be followed for new construction or other ground disturbing activity, including new target site designation.
10. Surveys will be conducted of existing military activity sites, using Service recommended methods by qualified desert tortoise biologists to the extent funds are made available. The objective will be to walk two hundred miles of transect per year

until all activity sites have been surveyed. Each activity site will require only one survey. Surveys will be conducted during regularly scheduled Range closures in the spring. The survey results, along with data on take at activity sites, will serve as the basis for identifying which, if any activity sites should be relocated. All data will be entered in the MCAS, Yuma geographic information system (GIS) data base. Any changes in survey methodology will be reported to the Service in an annual monitoring report.

11. Boundaries of all target sites, existing and proposed, will be determined in the field, mapped and flagged. All new target constructions will be placed within the boundaries of the designated target site. There will be an on-site tortoise monitor during target placement.
12. A Desert Tortoise Management Plan will be implemented in part, to identify ways to minimize impacts on tortoises from ongoing activities. This will include the relocation of some activities to areas of lower tortoise densities, based on the results of ongoing surveys.
13. EOD personnel will monitor take as part of their sweeps of target areas. EOD personnel will report to the tortoise management representative any injured or dead tortoises located during EOD sweeps, as well as habitat damage outside of designated target areas. Each EOD crew will fill out a form after each sweep, reporting any take. The tortoise management representative (or appointee) will accompany EOD crews on all sweeps.
14. The tortoise management representative, or appointee(s), will survey all ground support areas for dead or injured tortoises after the completion of each ground operation.
15. The Service will be notified by the tortoise management representative within three working days of the discovery of any tortoise death or injury caused by military activity. Notification will include the date, time, circumstances, and location of any injury or death. Dead animals will be left in situ. Injured animals will be taken to a veterinarian approved by the Service.
16. An annual monitoring report will be prepared and delivered to the Service on or before January 15 of each year. The report will briefly outline the effectiveness of the desert tortoise mitigation measures and summarize the mortality or injury to desert tortoises. To enhance desert tortoise protection, the report will make recommendations for modifying or refining the terms and conditions, herein.
17. Surveys will be conducted to further refine tortoise density estimates within critical habitat on the Range and to monitor and determine population trends using the most current methods accepted by the Service, Bureau of Land Management (BLM), and National Biological Survey. The primary objective of surveys would be to evaluate the effectiveness of management prescriptions set forth in the Desert Tortoise

Management Plan. Since there are currently no established survey methods for achieving these objectives, the Marine Corps will develop a survey program for the Range in consultation with the Service. Surveys will be conducted each year until the Mojave population of desert tortoise, or the East Colorado Recovery Unit, is removed from the list of threatened and endangered species. All survey data will be entered into the MCAS, Yuma GIS desert tortoise database.

18. A Desert Tortoise Management Plan (Management Plan) will be created (It is currently being developed in cooperation with the Service and BLM).
 - 18.1. The objective of the Management Plan will be to manage critical habitat for the desert tortoise within the Range in a manner consistent with recommendations presented in the *Desert Tortoise (Mojave Population) Recovery Plan* (U.S. Fish and Wildlife Service 1994).
 - 18.2. The Management Plan will be developed as part of the Northern and Eastern Colorado Desert Coordinated Management Plan being formulated by the BLM. The Management Plan will only address the management of desert tortoises and their habitat within the Range.
 - 18.3. The Management Plan will establish a portion of the Range as part of the Chuckwalla Desert Wildlife Management Area (DWMA). Established within the Chuckwalla DWMA will be Limited Use Zones (LUZs) where military activity will be excluded. The Management Plan will also establish experimental management zones within the Chuckwalla DWMA. These would be within critical habitat where military activities would continue.
 - 18.4. Surveys to monitor tortoise population trends would be used to evaluate the effectiveness of protective measures. Survey results could be used to compare population trends on the Range with areas receiving other management prescriptions on BLM lands, and to evaluate tortoise management practices based on the results of these comparisons.
 - 18.5. The Management Plan would also establish protective measures in areas of the Range outside of critical habitat.

EFFECTS OF THE PROPOSED ACTION ON THE LISTED SPECIES

Species Account

The desert tortoise is a large, herbivorous reptile. Optimal habitat for this species has been characterized as creosote bush scrub in which precipitation ranges from two to eight inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Turner 1982, and Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or

sandy soils with some clay, but are occasionally found in windblown sand or in rocky terrain (Luckenbach 1982). Live desert tortoises have been found in the California desert from below sea level to an elevation of 2,190 meters (7,300 ft), but the most favorable habitat occurs at elevations of about 300 to 900 meters (1,000 to 3,000 ft) (Luckenbach 1982; Schamberger and Turner 1986).

Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Desert tortoises spend the remainder of the year in burrows, escaping the extreme conditions of the desert. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein et al. (1987), and U.S. Fish and Wildlife Service (1994).

Desert tortoises are found in portions of the California, Arizona, Nevada, and Utah deserts. They also occur in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the creosote, shadscale, and Joshua tree series of Mohave desert scrub, and the lower Colorado River Valley subdivision of Sonoran desert scrub.

On April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (Service 1990). The Mojave population includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California (a division of the Sonoran Desert). Reasons for the determination included loss and degradation of habitat from construction projects such as roads, housing and energy developments, and conversion of native habitat to agriculture. Grazing and off-highway vehicles have degraded additional habitat. Also cited as threatening the desert tortoise's continuing existence were illegal collection, upper respiratory tract disease, and predation on juvenile desert tortoises by northern ravens (*Corvus corax*).

On February 8, 1994, the Service designated approximately 6.4 million acres of critical habitat for the Mojave population of the desert tortoise (U.S. Fish and Wildlife Service 1994). The designation became effective on March 10, 1994. A final Recovery Plan (U.S. Fish and Wildlife Service 1994) for the desert tortoise was published in June 1994. The recovery plan is the basis and key strategy for recovery and delisting of the desert tortoise. Following the recommendations of the desert tortoise recovery team, the Recovery Plan identifies six Recovery Units and recommends establishment of 14 Desert Wildlife Management Areas (DWMA) within the recovery units. The six recovery units represent the biotic and abiotic variability found in desert tortoise habitat. The boundaries of DWMA's were to follow accepted concepts of reserve design and, as part of the actions needed to accomplish desert tortoise recovery, the Plan recommends that human activities that negatively affect desert tortoises in DWMA's should be restricted (U.S. Fish and Wildlife Service 1994). Within each, the recovery plan recommends specific management actions to achieve recovery of desert tortoises.

The Chocolate Mountain Gunnery Range is situated with the eastern Colorado Desert

recovery unit. The Recovery Plan has recommended establishment of the Chuckwalla DWMA which would encompass a portion of the Range. The proposed Chuckwalla DWMA is composed of critical habitat for the desert tortoise. Approximately 40 percent of the Range lies within designated desert tortoise critical habitat, that is, most of the Range east of the Chocolate Mountains. Approximately 30 percent of the designated critical habitat on the Range is currently used for military activity. The proposed actions will affect less than 10 percent of this critical habitat, that is already in use on the Range.

Between 1992 and 1993, surveys for desert tortoises using strip transects were conducted over the Range. These surveys focused on military activity sites (e.g., targets), and provide the most current data on tortoise distribution and densities on the Range. Other desert tortoise surveys have been conducted since 1982. Survey results and maps depicting estimates of desert tortoise density appeared in the BA. These results are depicted in Table 1. Density estimates of tortoise and burrows on the Range are low, west of the Chocolate Mountains (SEAL Camp CCC & CP Bull). The highest densities of tortoise, and tortoise burrows, occurred in the Chuckwalla Bench area in the northeast portion of the Range (HAWK site, Target 2N, Target 9N, & Deadman CAS). There are also estimated high densities of tortoises on the east-central border of the Range (Gun Pos. 9A & Gun Pos. 8). Burrows and tortoise densities tended to be higher in the Chuckwalla Bench area than in the southeastern and western portions of the Range (Dames & Moore 1994). Detailed descriptions of survey sites can be found in Dames & Moore (1994). Of the 605 square miles in the Range, approximately 242 square miles are in designated critical habitat. Using an average density figure of 35 tortoises per square mile, there are approximately 8,470 individuals in critical habitat on the Range.

Table 1. Estimated Density of Desert Tortoise and Burrows at Target Sites

Activity Site	Tortoises Per Sq. Mile	Burrows Per Sq. Mile	Year of Survey
HAWK Site	101-250	301-400	1993
Target 2N	21-50	201-300	1993
Gun Pos. 9A	21-50	201-300	1993
Target 9N	51-100	101-200	1993
Deadman CAS	21-50	101-200	1993
Gun Pos. 8	21-50	101-200	1993
SEAL Camp CCC	0-20	0-100	1993
Target 1S	21-50	0-100	1993
Targets 12S, 13S, & 15S	0-20	0-100	1993
Targets 4S & 5S	21-50	0-100	1993
Targets 10S & 11S	21-50	0-100	1993
FARP South	21-50	0-100	1993

Activity Site	Tortoises Per Sq. Mile	Burrows Per Sq. Mile	Year of Survey
CP BULL	0-20	0-100	1993
Target 4N	21-50	0-100	1992
Target 1S	0-20	0-100	1992
Target 5S	0-20	0-100	1992
Target 11S	21-50	0-100	1992

Analysis of Impacts

Current Activities

Continued use of CAS, Rockeye munitions ranges, and target sites may kill or injure desert tortoises. Collapsed burrows from activities could trap individual animals. Desert tortoises may be killed or injured by gunnery and explosive ordnance activities within unfenced target impact zones. Potential mortality or injury to tortoises from bombing is likely to be proportional to the densities of tortoise burrows at and in the vicinity of the targets.

Current activities may further degrade disturbed desert tortoise habitat associated with target impact zones. Impact craters and debris from bombs and other ordnance have altered the plant composition in some areas (Dames & Moore 1994). Desert tortoises that cross these areas, denuded of natural vegetation, could become more vulnerable to predation and thermal stress in the absence of shrub cover. The craters and debris may also serve as a barrier to the movement of desert tortoise which are resident in the vicinity. The effects of bombing on substrate with well developed desert pavement may persist for hundreds of years (Dames & Moore 1995).

Although uncommon in desert areas, wildfires caused by ordnance may degrade or destroy desert tortoise habitat and may kill individuals. Larger fires could fragment desert tortoise habitat and recurrent fires may reduce the abundance and diversity of native forbs which are the major food source of the desert tortoise.

Desert tortoises may be harmed from noise and ground disturbance generated from: 1) gunnery or explosive ordnance activities; and 2) low-level subsonic or supersonic aircraft flights. An increase in the net explosive weight limit may proportionately increase the impacts associated with noise and ground disturbance. Specific effects of increased noise levels on desert tortoise are not known. However, noise and vibration generated by off-highway vehicles have caused physical damage and behavioral modification in other desert species, such as the desert kangaroo rat (*Dipodomys deserti*), Mojave fringe-toed lizard (*Uma scoparia*), and Couch's spadefoot toad (*Scaphiopus couchi*) (Brattstrom and Bondello 1983). It is likely that desert tortoises are also subjected to some physical damage and stress from these impacts.

SEAL's training conducted by NSWG-1 in its current locations has the potential to result in high mortality and injuries to tortoises. The eastern portions of Training Area 1 support estimated high densities of tortoises, and the FAV training course traverses an area of estimated high densities in the northeast portion of the Range (Dames & Moore 1995). This portion of Training Area 1 occurs in desert tortoise critical habitat. The potential for mortality and injury to tortoises from use of this portion of the FAV training course appears to be high since these vehicles travel at speeds of approximately 55 miles per hour.

Desert tortoises may be killed or injured by vehicles that use existing maintenance roads or travel off-road to retrieve ordnance debris (Bury 1978; Luckenbach 1975; Nicholson 1978). Tortoises that are removed from harms way in impact zones and off maintenance roads may be affected directly by physical stress of the relocation, and by associated stresses, such as lack of knowledge of cover sites, nest sites, foraging areas, and loss of bodily fluids.

Individual desert tortoise could be taken by predators such as common ravens or coyotes (*Canis latrans*), that can be attracted to sites by human activities. Also, if populations of the coyote and northern raven increase due to these activities, the desert tortoise population at the Chuckwalla Bench could be adversely affected through increased predation.

Proposed Activities

The proposed delivery of ordnance (bombing) between 2200 and 0600 hours would increase noise and vibration impacts to 24 hours per day from the current 16 hour per day.

The proposed increase in net weight limit of bombs, the proposed use of live ordnance in R-2507N section, the redevelopment of seven inactive target sites in R-2507N, and the development of three new individual target sites could cause an increase in the noise and vibration levels, as well as new ground disturbance. The relocation of two ground support areas and a drop zone will increase ground disturbance in new areas and alter habitat. Tortoise mortality could occur in the course of this disturbance. Current desert tortoise habitat could be adversely modified. Wildfires could increase in number and could occur in new areas. Clearance sweeps could kill, injure, or harass tortoises and possibly prevent habitat from recovering.

On a more positive note, the reconfiguring of the SEALs training area may reduce potential adverse affects of SEAL training on desert tortoises and critical habitat, as will eliminating the FAV training course.

Density of tortoises (from 0-20 to 101-250 individuals/square mile) and tortoise burrows (from 0-100 to 301-400 individuals/square mile) at target sites is extremely variable (See Table 1). In order to estimate the take from the current and proposed activities, the Service looked at the following variables: total Range size; proportion of Range in and out of critical habitat; 1992-93 tortoise density estimates over various parts of the Range; and magnitude and frequency of impacts. Without empirical data, the Service is using a probability of tortoise mortality resulting from ordnance impact of one in one hundred over the course of a year. This would result in the take of approximately eleven individuals annually in the form

of mortality over the 32 square miles directly affected by current and proposed activities. Using a probability for harassment of one in ten over the course of a year, this would result in a take of one hundred twelve individuals annually in the form of harassment associated with current and proposed activities.

CUMULATIVE EFFECTS

Cumulative effects are those impacts of future non-Federal (State, local government, or private) activities on endangered or threatened species or critical habitat that are reasonably certain to occur during the course of the Federal activity subject to consultation. Future Federal actions are subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative with the proposed project.

Many of the actions that are reasonably expected to occur within the vicinity of the Range will be subject to future section 7 consultations because the Federal government administers large portions of the desert. Activities such as grazing, ground-water pumping, and recreational use, and events such as fire, that occur on private lands may not be subject to section 7 requirements and can contribute to continued desert tortoise take and habitat degradation. To the extent that the effects of these activities are foreseeable, they are subject to the prohibitions of sections 9 and 10 of the Act. The Service is unaware of any proposed activities on private lands in the action area that are not subject to Federal oversight.

BIOLOGICAL OPINION

The Service does not believe that the impacts of the proposed action, in conjunction with cumulative effects, are sufficient to jeopardize the continued existence of the Mojave population of the desert tortoise or result in significant destruction or adverse modification of its critical habitat. We base this conclusion on the following facts:

1. The approximate acreage of disturbed desert tortoise critical habitat from current activities is less than 93,000 acres. However, only 13,000 acres of desert tortoise critical habitat will continue to be degraded by activities due to the proposed closing of Training Area 1 (80,000 acres). This is a relatively small fraction (0.013 percent) of the overall acreage of critical habitat within the Chuckwalla Critical Habitat Unit (1,020,600 acres). Current plus proposed training actions are estimated to affect only 20,480 acres (32 square miles) which represents only two percent of the critical habitat.
2. MCAS, Yuma has incorporated several actions to minimize the take of desert tortoise and compensate the loss of habitat value.
3. Areas will be established that will be protected for the long-term conservation of desert tortoises on the Range.

4. A Management Plan will be developed and adaptively implemented, to actively pursue efforts to conserve desert tortoises and their habitat on the Range.

INCIDENTAL TAKE

Section 9 of the Act prohibits the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Under the terms of section 7(b)(4) and 7(o)(2) of the Act, taking that is incidental to and not intended as part of the proposed action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take statement. The terms and conditions described below are nondiscretionary and must be undertaken.

Based on the analysis of impacts provided above, mitigation measures proposed by MCAS, Yuma, desert tortoise surveys conducted by consultants, and anticipated project duration, the Service anticipates that the following take could occur as a result of the proposed action:

1. Eleven (11) desert tortoises may be incidentally injured or killed by ordnance or vehicles during training activities each year.
2. One hundred twelve (112) desert tortoises may be harassed by removal from target impact zones or roads during military activities each year.

If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring review of the reasonable and prudent measures provided. MCAS, Yuma shall immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures and re-initiation of consultation.

Reasonable and Prudent Measures

The Service believes that the following Reasonable and Prudent Measures are necessary and appropriate to minimize incidental take.

1. Measures shall be taken to minimize mortality or injury of desert tortoises due to military activities in the Chocolate Mountain Range.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, MCAS, Yuma is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measure described above.

1. The following Terms and Conditions will implement Reasonable and Prudent Measure

should any listed species be found dead or injured in or adjacent to the action area. Notification must include the date, time, and location of the carcass, cause of death or injury, and any other pertinent information. In the event that MCAS, Yuma suspects that a species has been taken in violation of the terms and conditions contained within this biological opinion, such situation shall be reported to the Service's, Divisions of Law Enforcement, San Diego, California at (619) 557-5063.

CONSERVATION RECOMMENDATIONS

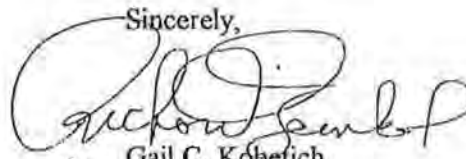
Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" has been defined as Service suggestions regarding discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information.

1. The Service recommends that MCAS, Yuma initiate a study to determine the effects of noise and ground vibrations generated from: (1) gunnery or explosive ordnance activities, and (2) low-level aircraft flights on desert tortoises living on the Range.
2. The Service recommends that MCAS, Yuma develop a habitat restoration plan to rehabilitate closed target sites, training areas, and unnecessary roads in desert tortoise critical habitat.

CONCLUSION

This concludes the formal consultation on the current and proposed military use of the Chocolate Mountain Aerial Gunnery Range, California. As required by 50 CFR 402.16, reinitiation of formal consultation is required if the action is significantly modified in a manner not discussed above, if new information becomes available on the listed species, or if the incidental take limit is exceeded. We would appreciate notification of your final decision on this matter. Any questions or comments should be directed to Karen Jensen of my staff at (619)431-9440.

Sincerely,

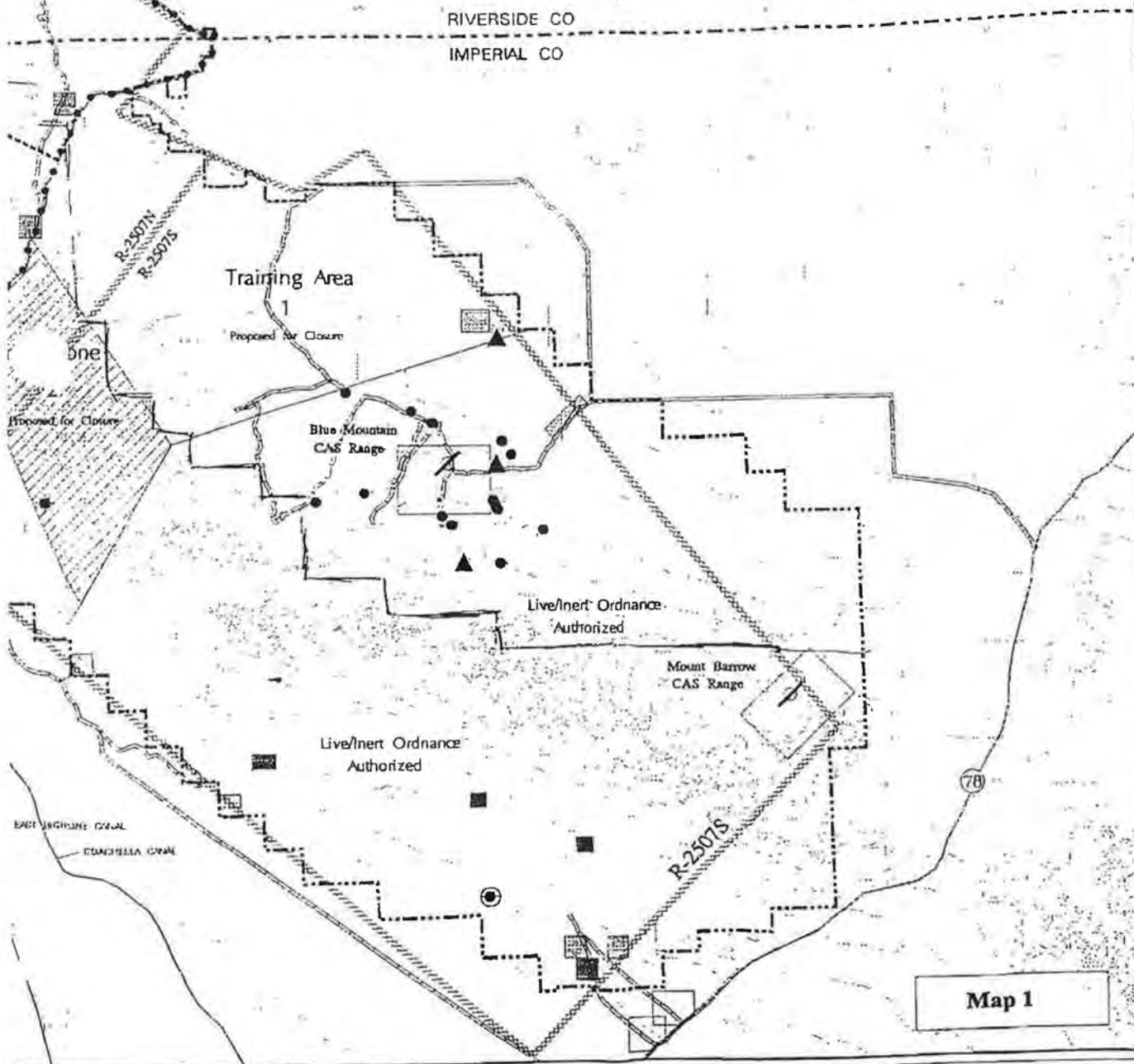


Gail C. Kobefich
Field Supervisor

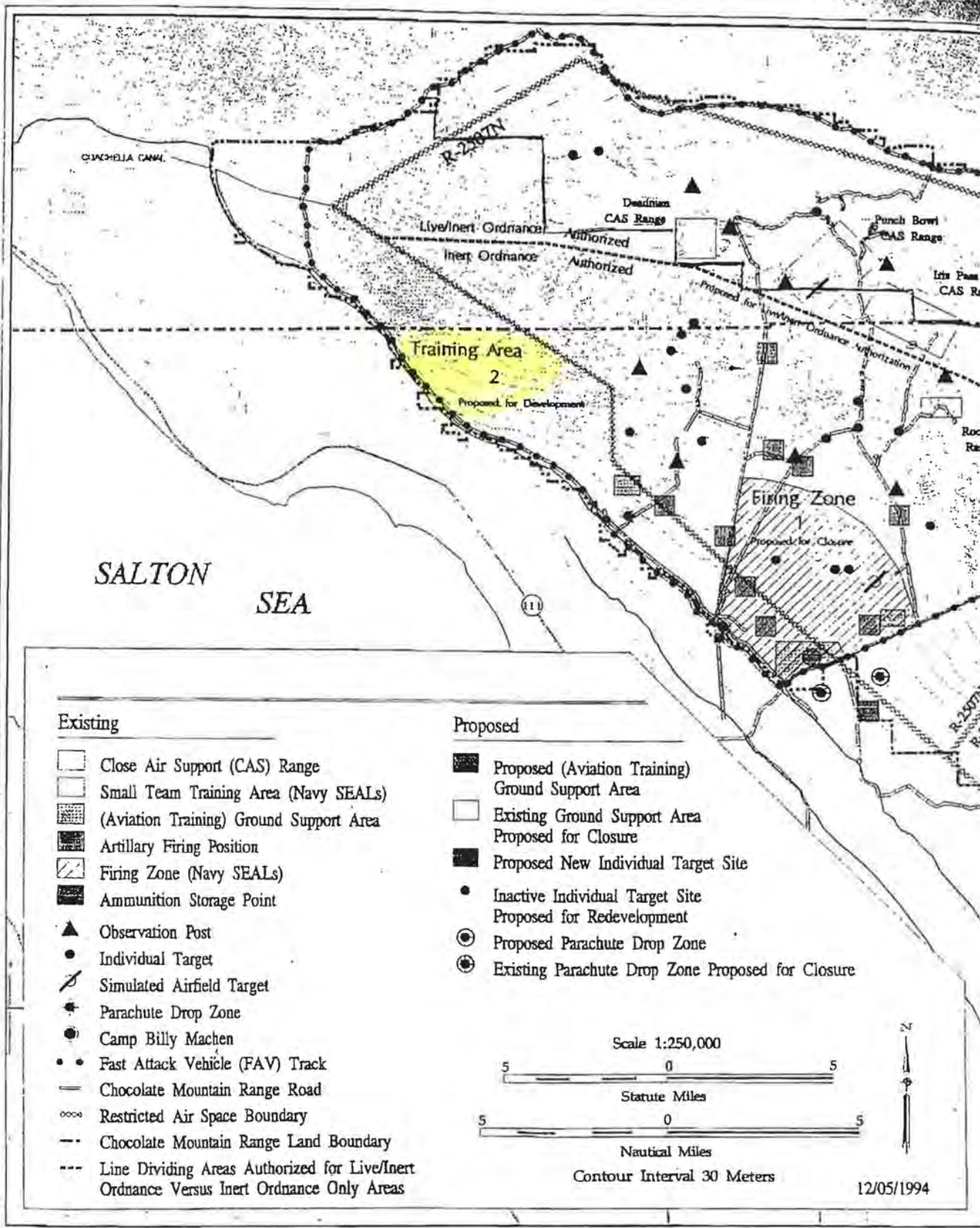
cc: Bill Fisher (SWDIV)
Ron L. Pearce (MCAS, Yuma)

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Existing and Proposed Training Facilities and Ground Support Areas Chocolate Mountain Range



Obtained from Biological Assessment (Dames & Moore, 1995)



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Appendix F. Environmental Assessment

FORMAT PAGE

ENVIRONMENTAL ASSESSMENT

FOR THE REVISED INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN, CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE, CALIFORNIA

Prepared for:



Naval Facilities Command
Southwest, San Diego,
California



United States Marine Corps
Installation Chocolate
Mountain Aerial Gunnery
Range, California

Prepared by:



**VERNADERO
GROUP**
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Suite 210
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Contract No.
N62473-13-D-4814-0009
Task Order No. 0009

January 2017



HOW THIS ENVIRONMENTAL ASSESSMENT IS ORGANIZED

The EXECUTIVE SUMMARY briefly describes the Proposed Action and alternatives. Impacts and conclusions are summarized.

ACRONYMS AND ABBREVIATIONS

SECTION 1	PURPOSE AND NEED
SECTION 2	DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES
SECTION 3	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES
SECTION 4	SUMMARY OF FINDINGS AND CONCLUSIONS
SECTION 5	REFERENCES
SECTION 6	LIST OF PREPARERS AND CONTRIBUTORS
SECTION 7	LIST OF INDIVIDUALS AND AGENCIES CONSULTED

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**ENVIRONMENTAL ASSESSMENT FOR THE
REVISED INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN, CHOCOLATE
MOUNTAIN AERIAL GUNNERY RANGE, CALIFORNIA**

Lead Agency for the EA: United States Department of the Navy

Title of Proposed Action: Revision of the Integrated Natural Resources
Management Plan, Chocolate Mountain Aerial Gunnery
Range, California

Location of the Proposed Action: State of California, Imperial and Riverside Counties

Document Type: Environmental Assessment

Abstract

This Environmental Assessment has been prepared by the United States Department of the Navy in accordance with the National Environmental Policy Act of 1969, the Council on Environmental Quality implementing regulations set forth in 40 Code of Federal Regulations § 1500-1508; Marine Corps Order P5090.2A, with Changes 1-3, *Environmental Compliance and Protection Manual*, Chapter 12; and other applicable laws. The Proposed Action is implementation of a Revised Integrated Natural Resources Management Plan (INRMP) for the Chocolate Mountain Aerial Gunnery Range, which is located in Imperial and Riverside counties in California. The revision to the 2014 INRMP is required under the National Defense Authorization Act for Fiscal Year 2014, which mandates the Secretary of the Navy to update the Chocolate Mountain Aerial Gunnery Range INRMP in coordination with the Secretary of Interior.

This Environmental Assessment describes the potential environmental consequences resulting from the Proposed Action (Alternative 1) and the No Action Alternative (Alternative 2) in the following resource areas: land use; topography, geology, and soils; hydrology and water resources; biological resources; cultural resources; air quality; noise; visual resources; socioeconomics; transportation and circulation; utilities; hazardous materials and wastes; and health and human safety.

Prepared by: United States Department of the Navy

Point of Contact: Naval Facilities Engineering Command Southwest
Ms. Cece Dahlstrom
Central Integrated Product Team
1220 Pacific Highway
San Diego, California 92132-5190

January 2017

FORMAT PAGE

EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared by the United States Department of the Navy (DoN) in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality implementing regulations set forth in 40 Code of Federal Regulations § 1500-1508; Marine Corps Order P5090.2A, with Changes 1-3, *Environmental Compliance and Protection Manual*, Chapter 12; and other applicable laws.

The Proposed Action is implementation of a Revised Integrated Natural Resources Management Plan (INRMP) for the Chocolate Mountain Aerial Gunnery Range (CMAGR) which is located in Imperial and Riverside counties in California. The National Defense Authorization Act (NDAA) for Fiscal Year 2014 mandates the Secretary of the Navy to revise the CMAGR INRMP in coordination with the Secretary of Interior. Title XXIX, Subtitle E, of the FY14 NDAA directed the Bureau of Land Management (BLM) to transfer administrative jurisdiction of 228,324 acres previously withdrawn in support of the military operations to the DoN. The northwest boundary was realigned to the edge of the Bradshaw Trail so the trail is entirely on public land and under the jurisdiction of BLM. The DoN relinquished 629 acres to the BLM and 1,960 acres of BLM land, withdrawn for military use, that are immediately north of the Bradshaw Trail. The BLM will manage the transferred land in accordance with the Land Use Plan developed under Section 202 of the Federal Land Policy and Management Act of 1976, Title 43, United States Code 1712.

The Conservation Division at the Marine Corps Air Station Yuma is responsible for maintaining conditions of the range in support of the military training mission, as well as managing and protecting natural resources in accordance with the Sikes Act (16 United States Code § 670a-f, as amended) and Marine Corps Order P5090.2A, with Changes 1-3, *Environmental Compliance and Protection Manual*, Chapter 12.

Two alternatives are analyzed in this EA, the Proposed Action (which is the Preferred Alternative Revised INRMP Implementation), and the No Action Alternative.

Alternative 1 – Proposed Action (Preferred Alternative): Revised INRMP Implementation

The Proposed Action would adopt the Revised INRMP, which addresses the realignment of the CMAGR boundary. Land jurisdiction within the CMAGR prior to the FY14 NDAA followed a complicated checkerboard pattern with approximately 49 percent of the land administered by the BLM. Having multiple jurisdictions with varied administrative oversight led to challenging land management. Following the FY14 NDAA, all withdrawn land previously administered by BLM within the CMAGR is now managed by the DoN in accordance with this INRMP. The Proposed Action includes the programs and projects outlined in the INRMP. This EA is evaluating the Revised INRMP's programs and projects as required under NEPA.

Alternative 2 – No Action Alternative: Retain the 2014 INRMP with No Changes

The NEPA process requires the consideration of a No Action Alternative. This alternative serves as a baseline for comparison to the Proposed Action. Under the No Action Alternative, the Revised INRMP would not be implemented, and management activities would continue under the 2014 INRMP. This alternative would meet most regulatory requirements, however, the No Action Alternative would fail to meet the FY14 NDAA congressional mandate to complete a Revised INRMP. Table ES-1 summarizes the potential impacts from both alternatives.

Table ES-1. Summary of Potential Impacts by Alternative

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP for the CMAGR	No Action Alternative: Retain the 2014 INRMP with No Changes
Land Use	No impacts to land use are expected. Programs and projects proposed would not change land use nor result in any new land use incompatibilities. Proposed projects would benefit current land use by improving the quality of the training environment.	No impacts to land use are expected.
Topography, Geology, and Soils	No impacts to topography or geology are expected. Incidental and minimal impacts to soils may occur due to natural resource surveys and direct analysis of soils. Soil conditions may benefit from increased technical knowledge of soil properties and characteristics for the establishment of a monitoring framework for erosion and other soil-related impacts.	No impacts to topography or geology are expected. Incidental and minimal impacts to soils may occur due to natural resource surveys and direct analysis of soils similar to the Proposed Action.
Hydrology and Water Resources	No impacts to hydrological or water resources are expected. The CMAGR does not contain natural open-water sources. Artificial water sources (guzzlers) will be maintained in accordance with the Proposed Action.	No impacts to hydrological or water resources are expected.
Biological Resources	Moderate benefits for vegetation communities, general wildlife populations, and special status plant and wildlife species through the implementation of enhanced monitoring and surveying of biological resources. Restoration and maintenance of native habitats would aid in the recovery of listed species and the continued ecosystem function. Long-term benefits to all biological resources would occur through proactive natural resource management.	The 2014 INRMP has moderate benefits for vegetation communities, general wildlife populations, and special status plant and wildlife species through the implementation of monitoring and surveying of biological resources. Long-term benefits to biological resources would occur through proactive natural resource management.

CMAGR – Chocolate Mountain Aerial Gunnery Range; **INRMP** – Integrated Natural Resources Management Plan; **O₃** – ozone; **PM_{2.5}** – particulate matter less than 2.5 microns in diameter; **PM₁₀** – particulate matter less than 10 microns in diameter

Table ES-1. Summary of Potential Impacts by Alternative (cont.)

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP for the CMAGR	No Action Alternative: Retain the 2014 INRMP with No Changes
Cultural Resources	No significant impacts to cultural resources are expected. Incidental and minimal impacts to cultural resources may occur due to natural resource surveys. If an unknown cultural resource is discovered on the range, the Cultural Resource Manager would be notified.	No significant impacts to cultural resource are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.
Air Quality	No significant impacts to air quality are expected. Some activities would result in minor increases in emissions (e.g., fugitive dust and vehicle and equipment exhaust). Equipment usages associated with INRMP projects are not known at this time. Proposed emissions would be significantly below the <i>de minimis</i> thresholds for Imperial and Riverside counties, which are 100 tons per year for O ₃ precursors and 70 tons per year for PM ₁₀ for Imperial County and 25 tons per year O ₃ and 70 tons per year for PM ₁₀ for Riverside County. Pesticide application would result in minor, temporary impacts to air quality. Overall, impacts would be less than significant and would not contribute significant emissions to local or regional air quality.	No significant impacts to air quality are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.
Noise	No significant impacts from noise are expected. Minor, infrequent increases in noise would be associated with the project accessing the range for natural resource surveys and other wildlife management activities.	No significant impacts from noise are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.
Visual Resources	No impacts to visual resources would result. None of the proposed projects would impact visual resources.	No impacts to visual resources would result.
Socioeconomics	No impacts to socioeconomics are expected. No permanent residents live on the CMAGR, and the implementation of the Proposed Action would have no significant impacts on the local economy.	No impacts to socioeconomics would result.

CMAGR – Chocolate Mountain Aerial Gunnery Range; **INRMP** – Integrated Natural Resources Management Plan; **O₃** – ozone; **PM_{2.5}** – particulate matter less than 2.5 microns in diameter; **PM₁₀** – particulate matter less than 10 microns in diameter

Table ES-1. Summary of Potential Impacts by Alternative (cont.)

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP for the CMAGR	No Action Alternative: Retain the 2014 INRMP with No Changes
Transportation and Circulation	No significant impacts to transportation and circulation are expected. A minor, short-term increase in traffic would occur during the implementation of natural resource surveys, but this would not result in any significant impacts.	No significant impacts to transportation and circulation are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.
Utilities	No utilities impacts are expected. The Proposed Action would not create new utilities nor would it impact the existing infrastructure.	No impacts to utilities are expected.
Hazardous Materials and Wastes	No significant impacts from the use or storage of hazardous materials and waste are expected. Pesticides may be used to manage nonnative and invasive plant species. Fire suppressants may be used to mitigate fire danger following a Wildland Fire Management Plan. All use of pesticide and fire suppressants would be minor and infrequent and would follow all regulations and guidelines.	No significant impacts from the use or storage of hazardous materials and waste are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.
Health and Human Safety	No significant impacts to human health or safety are expected. Law enforcement patrols would increase the public safety by limiting access to unexploded ordnance, live fire training, etc. All associated personnel would be required to comply with applicable health and safety regulations.	No significant impacts to human health or safety are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.

CMAGR – Chocolate Mountain Aerial Gunnery Range; **INRMP** – Integrated Natural Resources Management Plan; **O₃** – ozone; **PM_{2.5}** – particulate matter less than 2.5 microns in diameter; **PM₁₀** – particulate matter less than 10 microns in diameter

Based on the detailed analysis contained herein, it is the conclusion of this EA that neither alternative would constitute a major federal action with significant impact on human health or the environment. It is recommended that a Finding of No Significant Impact for the Proposed Action be signed to complete the process of analysis under NEPA.

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LIST OF ACRONYMS AND ABBREVIATIONS

BASH	Bird Aircraft Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BO	Biological Opinion
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMAGR	Chocolate Mountain Aerial Gunnery Range
CO	Commanding Officer
DoD	Department of Defense
DoN	Department of the Navy
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Global Positioning System
I-	Interstate
INRMP	Integrated Natural Resources Management Plan
kV	kilovolt
LEIS	Legislative Environmental Impact Statement
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station

MW	Megawatt
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
O ₃	Ozone
PM _{2.5}	Particulate Matter Less than 2.5 Microns in Diameter
PM ₁₀	Particulate Matter Less than 10 Microns in Diameter
POD	Plan of Development
PV	Photovoltaic
REIR	Request for Environmental Impact Review
ROD	Record of Decision
ROI	Region of Influence
ROW	Right of Way
SEAL	Sea, Air and Land
SCE	Southern California Edison
SEGS	Solar Electric Generating System
SR	State Route
SWAT	Special Warfare Training Area
T&E	Threatened and Endangered
U.S.	United States
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
USMC	United States Marine Corps
VegCAMP	Vegetation Classification and Mapping Program
WFMP	Wildfire Management Plan

1.0 PURPOSE AND NEED

1.1 Introduction

The Chocolate Mountain Aerial Gunnery Range (CMAGR) has served as a military training range since 1942. The CMAGR is in Imperial and Riverside counties in the southeast corner of California, east of the Salton Sea, and west of Arizona (Figure 1-1). A component of the national defense training infrastructure, the CMAGR is indispensable to the continued and future readiness of the air and ground forces of the United States (U.S.) Department of the Navy (DoN) and U.S. Marine Corps (USMC), including Naval Special Warfare Sea, Air, and Land (SEAL) units. The need for quality training that provides a realistic approximation of the conditions that Marines, Sailors, Airmen, and Soldiers will face in combat as individuals and in small or large units cannot be overstated. The U.S. military is fully invested in the principle that high-quality training is essential to success and survival in combat. Access to ranges that offer flexible, diverse, and realistic training is essential to preparing tactical forces of the highest possible quality. Thus, the necessity of keeping the CMAGR fully in service can best be understood from two main perspectives: (1) the necessity of providing high-quality training and (2) the superlative qualities of the CMAGR for supporting that training.

This Environmental Assessment (EA) has been prepared by the DoN in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) implementing regulations set forth in 40 Code of Federal Regulations (CFR) 1500-1508; Marine Corps Order (MCO) P5090.2A, with Changes 1-3, *Environmental Compliance and Protection Manual*, Chapter 12; and other applicable laws. The revision to the 2014 INRMP is required under the National Defense Authorization Act for Fiscal Year 2014 (NDAA), which mandates the Secretary of the Navy to update the CMAGR INRMP in coordination with the Secretary of Interior. The Conservation Division at the Marine Corps Air Station (MCAS) Yuma is responsible for maintaining the condition of the range to support the military training mission, as well as managing and protecting natural resources in accordance with the Sikes Act (16 United States Code [U.S.C.] § 670a-f, as amended), and MCO P5090.2A, with Changes 1-3, *Environmental Compliance and Protection Manual*, Chapter 12 (Headquarters, USMC 2013).

1.2 Purpose and Need for Action

On 26 December 2013, President Barack Obama signed FY14 NDAA. Title XXIX, Subtitle E, of the FY14 NDAA directed the Bureau of Land Management (BLM) to transfer administrative jurisdiction of 228,324 acres of land previously withdrawn in support of the military operations to the DoN. The northwest boundary was realigned to the edge of the Bradshaw Trail so the trail is entirely on public land under the jurisdiction of BLM. The DoN relinquished 629 acres to the BLM and 1,960 acres of BLM land, withdrawn for military use, that are immediately north of the Bradshaw Trail. BLM will manage the land in accordance with the applicable Land Use Plan developed under Section 202 of the Federal Land Policy and Management Act of 1976, Title 43, U.S.C. 1712.

The 2014 CMAGR INRMP was revised to satisfy the FY14 NDAA and update strategies that allow for sustainable multipurpose use of its resources. Its objectives are to manage natural resources so there is no net loss of the CMAGR's ability to support its military purposes in a manner consistent with Department of Defense ecosystem management principles. Further, prescribed management benefits threatened and endangered species consistent with federal and state recovery actions for these species under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531, *et seq.*).

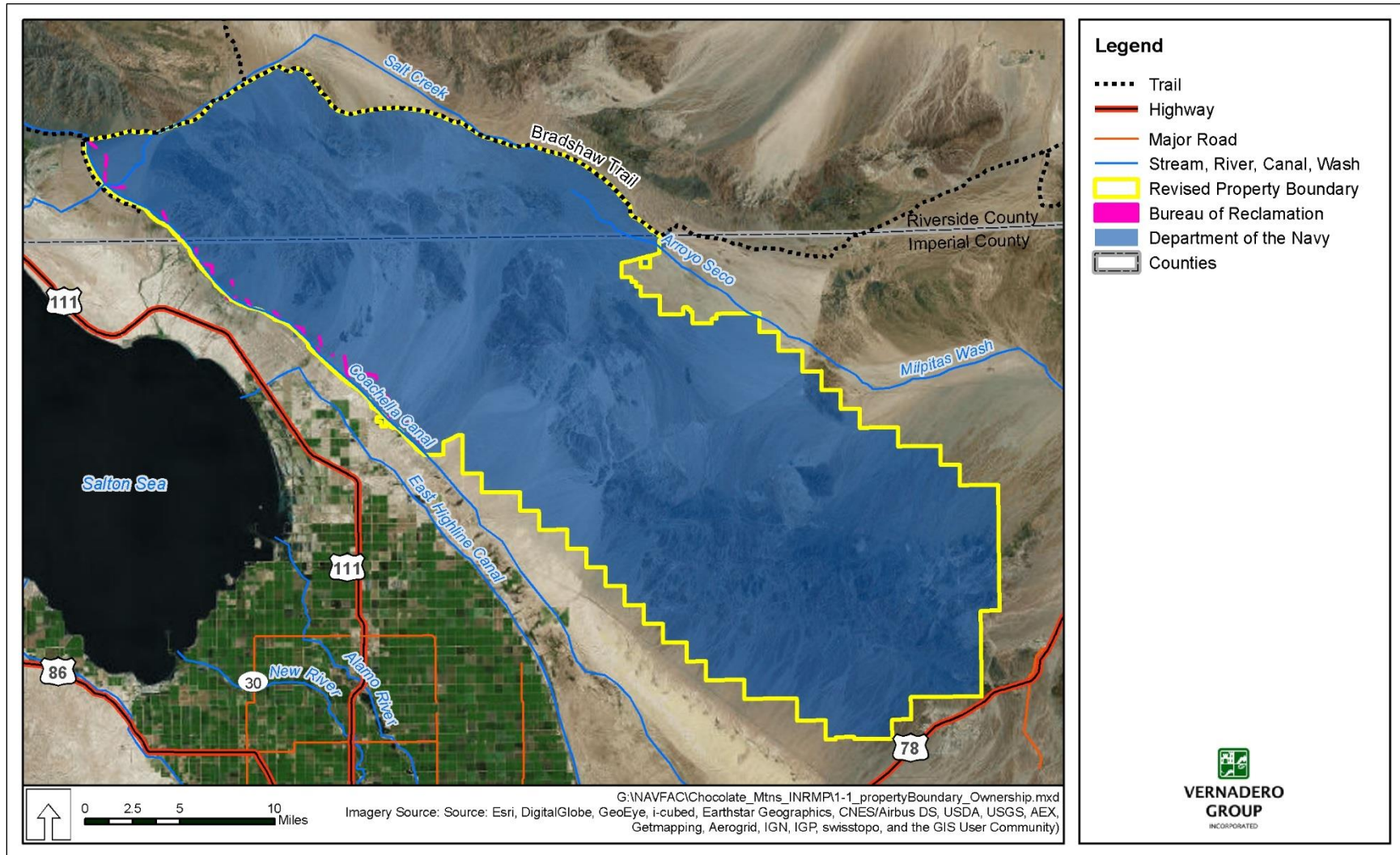


Figure 1-1. Administrative Jurisdiction and Range Boundary of the CMAGR

1.3 Summary of Key Environmental Compliance Requirements

1.3.1 National Environmental Policy Act

NEPA (42 U.S.C. 4321–4370h) is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed major federal actions before those actions are taken. NEPA established the CEQ, which was charged with the development of implementing regulations and ensuring federal agencies compliance with NEPA. The NEPA implementation process is codified in 40 CFR 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (CEQ regulations).

The USMC implements NEPA through *Procedures for Implementing the National Environmental Policy Act* (32 CFR 775), and MCO P5090.2A, with Changes 1-3 (Headquarters, U.S. Marine Corps 2013).

1.3.2 Integration of Other Environmental Statutes and Regulations

According to CEQ regulations, NEPA requirements must be integrated “with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively” (40 CFR 1500.2). Statutes, regulations, instructions, ordinances, rules, and policies applicable to the analysis in this EA are provided in the *Legislative Environmental Impact Statement for the CMAGR Withdrawal*, hereafter referred to as the LEIS (DoN et al. 2013). The NEPA process does not replace procedural or substantive requirements of other environmental statutes and regulations; it addresses them collectively in the form of an EA or Environmental Impact Statement (EIS), which enables the decision maker to have a comprehensive view of the key environmental issues and requirements associated with a proposed action. An EIS would need to be prepared if the Proposed Action or another selected alternative is expected to have significant impacts on the human or natural environment. If an EIS is deemed unnecessary based on the alternative selected for implementation, this decision would be documented in a Finding of No Significant Impact (FONSI) and signed by the CO of MCAS Yuma.

1.4 Decision to Be Made

Local command for military operation and administration of the CMAGR is delegated by the Secretary of the Navy to the Commanding Officer (CO), MCAS Yuma, Arizona. Based on the analysis of this EA, the CO will decide whether or not an EIS needs to be prepared.

1.5 Public Participation Opportunities

In keeping with established USMC policy to provide a transparent and open decision-making process, MCAS Yuma made this document available to applicable federal, state, and local agencies, tribes, stakeholders, and the general public for review and comment. Input from agency responses was incorporated into the potential environmental impacts analysis. Materials relating to agency or public involvement are included in Appendix A.

A public notice was published in the Yuma Sun Newspaper on 28, 29 and 30 October 2016. In addition, the EA was available online at <http://www.mcasylum.mil/Staff-and-Agencies/Range-Natural-and-Cultural-Resources/> and at the following libraries:

Yuma County Library District
Main Branch
2951 S. 21st Drive
Yuma, Arizona 85364

City of El Centro Public Library
1140 N. Imperial Avenue
El Centro, California 92243

Comments must have been postmarked by 30 November 2016 to be considered part of the NEPA process. Comments were to be submitted to:

Mr. Randy English
Conservation Manager
Range Management Department
Marine Corps Air Station Yuma
P.O. Box 99140
Yuma, Arizona 85369-9134
Email: randy.english@usmc.mil

A final decision document in the form of a FONSI or a Notice of Intent to complete an EIS would be issued following completion of the 30-day review period and will appropriately address comments received under this NEPA process.

1.6 Comments Received on the Draft Environmental Assessment

There were no comments received on the Draft Environmental Assessment during the 30-day review period.

Comments on the Draft INRMP were received from Pete Sorenson, Jody Fraser, and Kerry Holcomb of the U.S. Fish and Wildlife Service (USFWS) and Jack Crayon of the California Department of Fish and Wildlife (CDFW) recommending 1) revisions to the Desert Tortoise Management Plan, 2) very minor revisions to the document to provide additional detail on the availability of survey data used to support the plan, 3) minor corrections to species names and potential occurrences on the range, and 4) minor changes to the 5-Year Action Plan. All comments were addressed in the Final INRMP and did not result in any change in the potential impacts. Therefore, the conclusions of the Draft EA remain without revision and no substantive changes were made in the Final EA.

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2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section describes the Proposed Action and the No Action Alternative. The NEPA process evaluates potential environmental consequences associated with a proposed action and considers all reasonably acceptable alternative courses of action. In addition, CEQ regulations specify the inclusion of a No Action Alternative against which potential impacts can be compared (the baseline). While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in accordance with CEQ regulations.

2.1 Alternative 1 (Proposed Action and Preferred Alternative)

The Proposed Action is implementation of the 2017 Revised CMAGR INRMP. The revised plan reflects the commitment to conserve, protect, and enhance the range's natural resources in a manner that supports and enhances realistic military training. The plan's primary objective is to provide a proactive tool that allows the Installation to achieve resource management goals, mission requirements, and compliance with environmental regulations and policies. Proposed programs and projects (action steps) are outlined in Table 2-1. Alternative 1 (Proposed Action) is the USMC's Preferred Alternative. See Section 4.0 of the Revised INRMP titled *CMAGR Natural Resource Management Program* for a more detailed explanation of natural resource management programs, policies, objectives and action items.

Table 2-1. INRMP Programs and Projects

Program Area	Action Step	Frequency	Project Description
INRMP Implementation	4.1-1: Prioritize, seek funding for, and implement the INRMP	Annual	INRMP implementation is expected to provide for the sound natural resource management.
	4.1-2: Review the INRMP annually for operation and effect	Annual	INRMP reviews will re-evaluated as needed to ensure management goals and objectives are met.
NEPA Review	4.2-1: Provide expert review of potential impacts of federal actions	Ongoing	NEPA reviews will ensure the examination of all potential impacts of proposed projects on natural resources.
ESA Compliance	4.3-1: Adhere to conservation and relevant avoidance measures identified in USFWS BOs	Ongoing	Actions to protect T&E species include regulating speed limits and clearance surveys prior to construction activities within desert tortoise critical habitat.
	4.3-2: Manage Federal T&E species and their habitats to prevent jeopardy and assist in their recovery	Ongoing	Continue to actively participate in recovery efforts by reviewing available data in the planning and implementation of biological surveys and habitat maintenance.
	4.3-3: Manage Federal T&E species to minimize impacts to both mission and species	Ongoing	Continue to actively participate in recovery efforts by reviewing available data in the planning and implementation of biological surveys and habitat maintenance.
	4.3-4: Proactively collect information on Federal T&E species	Ongoing	Participate in research efforts, workshops, training, interagency meetings, and literature reviews.
	4.3-5: Develop and maintain a robust GIS data for Federal T&E species	Ongoing	Maintain a central database of field survey and other geospatial data.

BASH – Bird Aircraft Strike Hazard; **BGEPA** –Bald and Golden Eagle Protection Act; **BA** - Biological Assessment; **BLM** – Bureau of Land Management; **BO** – Biological Opinion; **CDFW** – California Department of Fish and Wildlife; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **DoD** – United States Department of Defense; **EA** – Environmental Assessment; **EIS** – Environmental Impact Statement; **ESA** – Endangered Species Act; **GIS** – geographic information system; **GPS** – global positioning system; **INRMP** – Integrated Natural Resources Management Plan; **MBTA** – Migratory Bird Treaty Act; **NEPA** – National Environmental Policy Act; **REIR** – Request for Environmental Impact Review; **T&E** – threatened and endangered; **USFWS** – United States Fish and Wildlife Service; **WFMP** – Wildland Fire Management Plan

Table 2-1. INRMP Programs and Projects (cont.)

Program Area	Action Step	Frequency	Project Description
Threatened or Endangered Species, Critical Habitat	4.4-1: Continue participation in annual desert tortoise surveys	Annual	Support line-distance surveys during the second quarter of each fiscal year.
	4.4-2: Map desert tortoise population densities, and habitat across the range	Ongoing	Maintain line-distance and field survey data.
	4.4-3: Continue to participate in the Desert Tortoise Management Oversight Group and the California Recovery Implementation Team. Develop project proposals to assist with the species recovery.	Ongoing	Continue participation in regional conservation efforts.
	4.4-4: Pending decisions of other State and Federal lead agencies, determine whether the reintroduction of a nonessential experimental population of Sonoran pronghorn will be compatible with training mission objectives and designed to avoid conflicting with range operations.	One-time	Participate in review process reintroduction efforts of a nonessential population of Sonoran pronghorn on the Chuckwalla Bench adjacent to the CMAGR.
	4.4-5: Assist in the coordination and provide in-kind and/or financial support to the Sonoran pronghorn reintroduction efforts	Varies	Provide funds (if available) and participating in meetings, field work, training, and administrative tasks.

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Table 2-1. INRMP Programs and Projects (cont.)

Program Area	Action Step	Frequency	Project Description
Other Special Status Species	4.5-1: Inventory and monitor special status species to establish a baseline from which conservation and management strategies can be devised	Ongoing	Coordinate surveys w/ partnering agencies to ensure survey data are consistent with regional efforts.
Migratory Birds and Eagles	4.6-1: Avoid and/or minimize impacts to migratory birds and eagles and their habitat	Ongoing	Compliance with the MBTA and BGEPA will be maintained.
	4.6-2: Conduct monitoring surveys periodically as part of an adaptive management strategy to better inform migratory bird management on the range.	Ongoing	Conduct monitoring surveys for migratory birds
	4.6-3: Develop, evaluate, and implement, conservation management actions to avoid or minimize incidental take of migratory birds and eagles	One-time	Include a biological component into safety briefs and conduct BAs, if necessary.
	4.6-4: Participate in regional or national inventory and monitoring programs	Ongoing	Coordinate inventory and monitoring efforts with partnering agencies.

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Table 2-1. INRMP Programs and Projects (cont.)

Program Area	Action Step	Frequency	Project Description
BASH Program	4.7-1: Maintain the existing MBTA depredation permit(s)	Annual	File renewal applications in a timely manner.
	4.7-2: Update as necessary and periodically evaluate possible improvements to this successful program that might further reduce BASH incidents.	Varies	Ensure biological concerns are addressed by participating in BASH meetings and evaluating StatO 3750.1B as necessary. Actions will continue to support the BASH Air Safety Officer in depredation, BASH reporting, submitting remains for identification, and other program support.
General Wildlife	4.8-1: Inventory and monitoring of reptiles, birds, amphibians, and small mammals	One-time	Coordinating surveys in cooperation with partnering agencies to ensure data are consistent with regional efforts.
	4.8-2: Maintain vegetation known to support wildlife	Ongoing	Employ invasive species management to limit competitive pressures on native species.
	4.8-3: Restore or enhance vegetation outside of heavy-use areas	Ongoing	Planting, reseeding, and other restoration activities will be performed.
Nonnative and Nuisance Wildlife	4.9-1: Work in partnership with BLM to control the wild burro population	Ongoing	Maintain communications with BLM and actively report incidental burro sightings.
	4.9-2: Inventory, monitor, and control raven populations	Ongoing	Survey and monitor raven populations and, in coordination with USFWS, implement various measures to minimize negative impacts to desert tortoises.
	4.9-3: Develop pest species management programs as needed to control pest mammals such as rabbits, skunks, raccoon, squirrels, coyotes, feral dogs, feral cats, and birds	One-time	Respond to nuisance animals and implement control actions.

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Table 2-1. INRMP Programs and Projects (cont.)

Program Area	Action Step	Frequency	Project Description
Vegetation	4.10-1: Complete vegetation mapping	Ongoing	Support the vegetation mapping efforts with a minimum mapping unit of 1076 square feet at the alliance level using the Federal Geographic Data Committee and National Vegetation Classification System criteria.
	4.10-2: Identify essential habitats for rare plants and wildlife	Varies	Record rare plant occurrences using GPS units during vegetation (i.e. invasive and nonnative plants) wildlife surveys.
Invasive and Nonnative Plant Species	4.11-1: Acquire reliable baseline data on the presence and abundance of invasive and nonnative plant species	Ongoing	Record rare plant occurrences using GPS units during vegetation (i.e. invasive and nonnative plants) and wildlife surveys.
	4.11-2: Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness	Ongoing	Record rare plant occurrences using GPS units during vegetation (i.e. invasive and nonnative plants) and wildlife surveys.
	4.11-3: Prioritize treatment of areas most likely to impact ecosystem health or mission readiness	Ongoing	Remove invasive and nonnative plants by physical, chemical, or mechanical means.
Wildland Fire Management	4.12-1: Develop and implement a WFMP	One-time	A WFMP will be developed; fire suppression activities may be required.
Wildlife Watering Sources	4.13-1: Maintain access to the guzzlers along the Coachella Canal to allow large mammals to move onto and off the CMAGR to use these guzzlers.	Ongoing	Install and maintain wildlife guzzlers.

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Table 2-1. INRMP Programs and Projects (cont.)

Program Area	Action Step	Frequency	Project Description
Ecosystem Management	4.14-1: Support research to obtain the best available scientific information to guide natural resource and conservation decisions	Ongoing	Access by researchers and collaborators will be coordinated to ensure safety and deconfliction with military training.
	4.14-2: Define and understand the CMAGR's relevance and responsibility towards regional conservation efforts	Ongoing	Research regional conservation.
	4.14-3: Update aerial imagery over time to determine to document landscape changes	Once per five years	Acquire aerial imagery and compare them to previous data.
	4.14-4: Utilize aerial imagery to conduct anthropogenic-impact-specific studies	One-time	Analyze imagery for visible impacts.
Soils	4.15-1: Establish a soils and erosion monitoring framework to evaluate temporal changes in soil resources	Ongoing	Complete erosion and sedimentation modeling using the best available data.
	4.15-2: Assess current watershed erosion status and evaluate possible engineering management practices that will minimize and mitigate erosion	One-time	Complete watershed surveys, modeling, and mapping to identify erosion potential and prioritize mitigation efforts.
	4.15-3: Develop spatial data related to soil associations and characteristics	One-time	Work in cooperation with the NRCS complete soil map using the best available modeling technology.

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Table 2-1. INRMP Programs and Projects (cont.)

Program Area	Action Step	Frequency	Project Description
Climate Change	4.16-1: Conduct an assessment of sustainability objectives and strategies in the context of climate change	One-time	Partner with meteorological, DoD, government agencies and research institutions to evaluate potential climate change impacts on military lands.
	4.16-2: Conduct vulnerability assessments of species and habitats most at risk	One-time	Partner with meteorological, DoD, government agencies and research institutions to examine species and their vulnerabilities.
	4.16-3: Collaborate with DoD mission leads, wildlife agencies, and other relevant partners to optimize the value of strategies developed for adaptation to climate change	Ongoing	Partner in collaborative ventures to access the most current information on local and regional levels.
	4.16-4: Install and maintain weather stations, including rain gauges at specific study locations	One-time	Install weather stations throughout the range.
Conservation Division GIS	4.18-1: Maintain an accessible GIS-based data also improve the likelihood of success for long-term planning	Ongoing	Centrally maintain GIS data collected in the field during surveys and other management actions.

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Table 2-1. INRMP Programs and Projects (cont.)

Program Area	Action Step	Frequency	Project Description
Cooperative Initiatives	4.19-1: Maintain cooperation with internal stakeholders (i.e., Environmental, Installations and Logistics, and Planning) and neighboring installations on natural resource management issues of mutual interest	Ongoing	This involves inter-departmental coordination of REIRs, EAs, BOs, EISs, and INRMPs.
	4.19-2: Maintain regular contact and coordination with cooperating agencies and other external stakeholders	Ongoing	Maintain communication with cooperating agencies, educational institutions, non-profits, and other external stakeholders.
Law Enforcement	4.21-1: Establish and maintain adequate control measures to provide for security, safety, and protection of natural resources	Ongoing	Install and maintain signs and other control measures.

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2.2 No Action Alternative

The No Action Alternative is required under the NEPA process and serves as a benchmark to compare to the Proposed Action and alternatives. Under the No Action Alternative, the Revised INRMP would not be implemented, and management activities under the 2014 INRMP would continue. While this alternative would meet most regulatory requirements, failure to update the 2014 INRMP would not meet the congressional mandate of the FY14 NDAA to complete a Revised INRMP.

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3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the conditions of, and possible impacts to, environmental resources by the Proposed Action and No Action Alternative. The documentation of existing conditions provides a natural resources baseline that allows an evaluation and identification of potential environmental changes from the implementation of alternative actions.

From the baseline conditions, potential impacts are described as environmental consequences. The CEQ regulations (40 CFR 1508.14) interprets the “human environment potentially affected” evaluate natural and physical resources in relationship of people with those resources. The term “environment” as used in this EA encompasses all aspects of the physical, biological, social, and cultural surroundings.

In compliance with the NEPA and CEQ regulations, the description of the affected environment focuses on those aspects potentially subject to impacts. Finally, cumulative impacts are addressed, defined by CEQ regulations 40 CFR 1500-1508 as those impacts attributable to the Proposed Action when combined with other past, present, or reasonably foreseeable future impacts regardless of the source.

3.1 Affected Environment

Implementation of the CMAGR Revised INRMP would result in minor changes to the operation and management of the range. A multidisciplinary group reviewed the proposed INRMP programs and projects to identify any areas that could be dismissed minimal environmental impacts and focus on areas of concern. Appendix B provides a project summary matrix and the potential impact under the Proposed Action.

Several resource areas were eliminated from further evaluation because impacts to identified resource areas would not be measurable, negligible, or clearly less than significant. Dismissed resource areas are identified in Table 3-1, which cross-references the discussion of each resource to the Revised INRMP and LEIS so information on the affected environment and previous discussions of activities on the range can be easily located.

Table 3-1. Resource Areas Dismissed from Further Analysis

Resource Area	Discussion
Land Use	No impacts to land use are expected. Programs and projects proposed would not change land use and would not result in any new land use incompatibilities. Proposed natural resources management projects would benefit current land use by improving the quality of the training environment. (LEIS Sections 3.2 and 3.3)
Topography, Geology, and Soils	No impacts to topography or geology are expected. Minimal impacts to soils may occur from surveys and direct soils analysis. Soil information will facilitate best management practices to control and prevent excessive soil erosion, implement soil conservation measures, and restore or rehabilitate degraded landscapes wherever practicable (Revised INRMP Section 3.1.1; LEIS Section 3.4.3)
Hydrology and Water Resources	No impacts to hydrological or water resources are expected. The CMAGR does not contain natural open-water sources. Artificial water sources (guzzlers) are maintained in accordance with the Proposed Action. (LEIS Section 3.5)
Cultural Resources	No significant impacts to cultural resources are expected. Incidental and minimal impacts to cultural resources may occur from natural resource surveys. Whenever historical artifacts are discovered, the GPS location and description are recorded and provided to the Cultural Resource Manager. (LEIS Section 3.8)
Air Quality	No significant impacts to air quality are expected. Some activities would result in minor increases in emissions such as fugitive dust and vehicle and equipment exhaust. Equipment usages associated with INRMP projects are unknown at this time. Proposed emissions would be significantly below the <i>de minimis</i> thresholds for Imperial and Riverside counties. Pesticide application would result in minor, temporary impacts to air quality. Overall, impacts would be less than significant and would not contribute significant emissions to local or regional air quality. (Revised INRMP Section 3.2; LEIS Section 3.6.1)
Noise	No significant impacts from noise are expected. Minor, infrequent noise increases would be associated with the project vehicles accessing the range for natural resource surveys and other wildlife management activities. (LEIS Section 3.9)
Visual Resources	No impacts to visual resources are expected. None of the proposed projects would impact visual resources. (See LEIS Section 3.10)
Socioeconomics	No impacts to socioeconomics are expected. No permanent residents live on or adjacent to the range and the implementation of the Proposed Action would have no significant impacts on the local economy. (LEIS Section 3.13)
Transportation and Circulation	No significant impacts to transportation and circulation are expected. A minor, short-term increase in traffic would occur during the implementation of natural resource surveys, but this would not result in any significant impacts. (LEIS Section 3.3.6)
Utilities	No impacts to utilities are expected. The Proposed Action would not create any new utilities on the Installation nor would it impact the existing infrastructure. (LEIS Section 3.3.4)
Hazardous Materials and Wastes	No significant impacts from the use or storage of hazardous materials and waste are expected. Pesticides may be used to manage nonnative and invasive plant species. Fire suppressants may be used to mitigate fire danger following a Wildland Fire Management Plan. All use of pesticide and fire suppressants would be minor and infrequent and would follow all regulations and guidelines (LEIS Section 3.12)
Health and Human Safety	No significant impacts to human health or safety are expected. Law enforcement patrols would increase the safety of the public by limiting access to unexploded ordnance, live-fire training, etc. All personnel associated with the implementation of the Proposed Action would be required to comply with applicable health and safety regulations. (Revised INRMP Section 2.4.1; LEIS Section 3.11)

CMAGR – Chocolate Mountain Aerial Gunnery Range; **INRMP** – Integrated Natural Resources Management Plan; **LEIS** – Legislative Environmental Impact Statement; **O₃** – ozone; **PM_{2.5}** – particulate matter less than 2.5 microns in diameter; **PM₁₀** – particulate matter less than 10 microns in diameter

Biological resources is the only resource area identified with a potential to receive more than negligible impacts or warrants further review and evaluation. The INRMP provides a detailed description of the biological resources affected and an abbreviated version is provided below to assist in understanding the context of potential environmental consequences.

Vegetation and Wildlife

As shown in Figure 3-1, four natural communities dominate the CMAGR: 1) Lower Bajada and Fan Mojavean – Sonoran Desert Scrub (31.3 percent), 2) Madrean Warm Semidesert Wash Woodland/Scrub (32.5 percent), 3) North American Warm Desert Bedrock Cliff and Outcrop (35.7 percent), and 4) Shadscale - Saltbush Cool Semidesert Scrub (0.5 percent) (California Energy Commission 2014). The best available data for vegetation is from the Vegetation Classification and Mapping Program, or VegCAMP (VegCAMP et al. 2013). More extensive vegetation mapping is currently under way. Refer to Section 3.3.1 of the Revised INRMP for an in-depth description of the four natural communities. The CMAGR supports approximately 190 wildlife species. For an in-depth description of the wildlife observed, refer to Section 3.3.2 of the Revised INRMP.

Special Status Species

Special status species include federally threatened or endangered species protected by Federal and State ESAs. This species of special concern by the USFWS, CDFW and/or California Native Plant Society. No rangewide surveys for special status species have been conducted. Special status species reported have been observed during focused surveys (e.g., desert tortoise or vegetation mapping).

The primary special status species of concern is the Agassiz desert tortoise (*Gopherus agassizii*), hereafter referred to as desert tortoise, a federally threatened species protected by the ESA, as well as species protected by the California ESA. Other special status species known to be present at the CMAGR are the Nelson's desert bighorn sheep (*Ovis canadensis nelsoni*), American badger (*Taxidea taxus*), and Couch's spadefoot toad (*Scaphiopus couchii*). Special status bird species that are either present or are occasional visitors include the golden eagle (*Aquila chrysaetos*), Cooper's hawk (*Accipiter cooperii*), Vaux's swift (*Chaetura vauxi*), Swainson's hawk (*Buteo swainsoni*), loggerhead shrike (*Lanius ludovicianus*), and burrowing owl (*Athene cunicularia*). Two special status species plants, Orocopia sage (*Salvia greatae*) and sand evening primrose (*Camissonia arenaria*). Special status species are discussed in depth in Section 3.3.3 and Appendix B of the Revised INRMP.

Habitat for Protected Species

Critical habitat is a specific geographic area deemed essential for the conservation of a threatened or endangered species that may require specific management and protection. Critical habitat may include areas that are not currently occupied by the species but are needed for its recovery. Critical habitat for the desert tortoise occurs on the eastern side of the CMAGR. A USFWS Biological Opinion (No. 1-6-95-F-40) concluded that the activities on the CMAGR

would not jeopardize, result in significant destruction, or adversely modify the desert tortoise's critical habitat (USFWS 1996). The USFWS based its opinion on the small percentage of critical habitat affected by training, implemented conservation measures, established conservation areas, and Management Plan implementation (refer to Section 3.3.3 of the Revised INRMP).

Wetlands and Aquatic Habitat

Congress enacted the Clean Water Act in 1972 to restore and maintain the chemical, physical, and biological integrity of the nation's waters (33 U.S.C. 1251, *et seq.*). Section 404 of the Clean Water Act delegates jurisdictional authority over wetlands to the U.S. Army Corps of Engineers and the Environmental Protection Agency. Wetlands or aquatic habitat do not occur on the CMAGR. Surface water is derived from infrequent rainfall events. Artificial tanks (guzzlers) and tinajas (natural bedrock depressions) are the only open-water sources available to wildlife. Refer to Section 3.1.3 in the Revised INRMP.

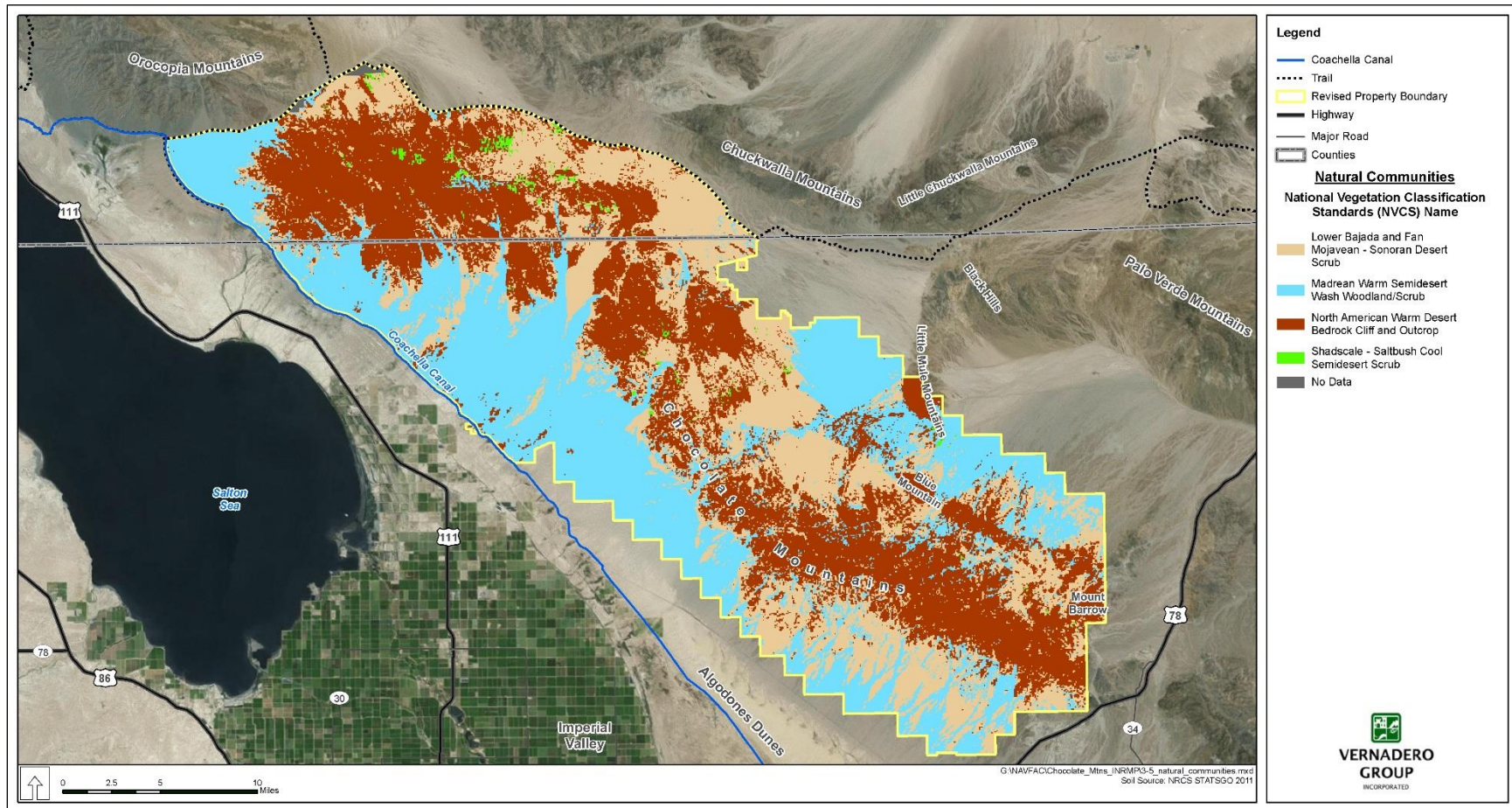


Figure 3-1. Ecological Systems of the CMAGR as Mapped by VegCAMP et al. 2013

3.2 Environmental Consequences

3.2.1 *Alternative 1 (Proposed Action)*

Table 2-1. *INRMP Programs and Projects* provided an overview of action items proposed under Alternative 1. See Section 4.0 of the Revised INRMP titled *CMAGR Natural Resource Management Program* for a more detailed explanation of natural resource management programs, policies, objectives and action items.

The objective of the Revised INRMP is to effectively manage the CMAGR s to support the Installation's mission with "no net loss" of military training capability. Physical impacts from INRMP projects are generally divided into three categories: natural resource surveys, vegetation restoration, and nonnative and invasive species removal. Although some minor, adverse impacts are expected as a result of these projects, they would be less than significant and the long-term benefit to the natural environment would outweigh the temporary adverse impacts.

Natural resources surveys would be conducted by traversing habitat. Impacts may include trampled vegetation or invertebrates, noise disturbances to nesting birds and other wildlife, soil erosion and compaction, and creation of fugitive dust. These impacts, however, would be minor, temporary, and infrequent and would not any present long-term impacts to biological resources.

Vegetation restoration often consists of the installation of exclusion fencing, vegetation removal and recontouring the project site. Impacts may include trampled vegetation or invertebrates, noise disturbances to nesting birds and other wildlife, soil erosion and compaction, and creation of fugitive dust. This type of work would have temporary and minor adverse impacts to the habitat, but once completed would benefit overall habitat quality and biological resources.

Nonnative and invasive species removal would be performed by physical, mechanical, and/or chemical means; all three methods could temporarily impact biological resources. Physical removal would include personnel or contractors traversing infested areas to hand pull vegetation, possibly disturbing non-target vegetation, invertebrates, and other wildlife. Mechanical removal would involve using gas-powered machinery, such as weed whackers and mowers, which would create noise disturbances to wildlife and disturb soils. Chemical treatment would be conducted in accordance with the Installation's Integrated Pest Management Plan and applicable federal, state, and local laws and regulations. In the event of a petroleum or chemical spill, the Installation would enact its Spill Plans to contain and clean up the spilled material. Overall, nonnative and invasive species removal would provide long-term, beneficial impacts by eradicating pest and invasive species that damage or destroy native species.

3.2.2 *No Action Alternative*

If the No Action Alternative is selected, natural resource management programs, policies, objectives and action items of the Revised INRMP would not be implemented and the CMAGR would retain the 2014 INRMP. The continued implementation of the 2014 INRMP would have similar direct impacts to biological resources as the implementation of the Revised INRMP.

Impacts would be minor, temporary, and infrequent and would not present long-term impacts to biological resources.

3.3 Cumulative Impacts

NEPA defines cumulative effects as the impact on the environment which results from incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7).

The Region of Influence (ROI) for cumulative impacts analysis depends on the action and the extent of the impacts' reach. For biological resources, the ROI extends beyond the CMAGR boundaries because external activities may affect regional wildlife populations, biological resources viability, and wildlife corridors. External activities include the multiple alternative and traditional energy projects in various stages of development within the ROI. Threats to regional biological resources resulting from the projects in and around the CMAGR are primarily related to the desert tortoise. For this analysis, the ROI considers ecological relationships at the landscape level; encompassing the area between Interstates 8 and 10 and between the Colorado River and west of the Imperial Valley.

Table 3-2 lists all CMAGR and external projects considered in the cumulative analysis. Multiple military training, construction, and INRMP projects are currently under way. Environmental reviews were completed for all projects within CMAGR's desert tortoise management area. In addition, given the large size of the ROI and the extensive avoidance and mitigation measures implemented under both alternative and traditional energy projects, these external projects are expected to have minor impacts to the continued viability of desert tortoise.

INRMP Implementation, when combined with current and planned projects and external projects identified in Table 3-2, is not expected to have any adverse cumulative impact on biological resources within the ROI.

On the contrary, the Revised INRMP provides benefits to biological resources through survey data collected that will provide direction for the protection, restoration, and habitat enhancements; invasive and nonnative species removal; guzzler maintenance; and compliance with applicable laws and regulations. MCAS Yuma also implements intense and proactive management of the desert tortoise population. Overall positive cumulative impacts to biological resources are expected with the implementation of the Proposed Action or the No Action Alternative.

Table 3-2. Cumulative Projects and Potential Impacts

Project Name	Project Location	Project Description	Current Project Status	Notable Potential Project Impacts
Black Mountain Wind Project No. 1	Black Mountain south of CMAGR	Wind energy testing and development for eight meteorological towers on 15,335 acres, approximately 40 acres of footprint for the towers	BLM is awaiting a POD.	<ul style="list-style-type: none"> • Impacts to biological resources • Beneficial impacts to GHG
Black Mountain Wind Project No. 2	Black Valley near SR 87 and Ogilby Road	Wind energy testing and development for three meteorological towers on 11,227 acres, approximately 15 acres of footprint for the towers	BLM is awaiting a POD.	<ul style="list-style-type: none"> • Impacts to biological resources • Beneficial impacts to GHG
Blythe Solar Power Project	Near Blythe, CA	485 MW solar facility on 4,138 acres of BLM land with a 230 kV transmission line connecting to the SCE Colorado River substation	Draft EIS was submitted for public comment in 2014.	<ul style="list-style-type: none"> • Impacts to biological resources, water resources, air quality, and desert tortoise • Beneficial impacts to GHG
CDFW Big Game Guzzlers	CMAGR	Installation of up to five wildlife guzzlers	This is ongoing.	<ul style="list-style-type: none"> • Beneficial impacts to bighorn sheep and desert mule deer
Chocolate Mountain Solar Farm Extension	Northwest of Niland, CA	Construction of a 49.9 MW PV solar power plant	Conditional use permit was obtained in 2013.	<ul style="list-style-type: none"> • Air quality impacts • Benefits to socioeconomics due to job creation • GHG emissions reduced
CMAGR Geothermal Well Drilling	CMAGR, northwest of Camp Billy Machen	Drill geophysical test holes to investigate hydrothermal potential at three sites	This was completed in 2011.	<ul style="list-style-type: none"> • Impacts to geological resources, including soils and groundwater • Impacts on desert tortoises

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Table 3-2. Cumulative Projects and Potential Impacts (cont.)

Project Name	Project Location	Project Description	Current Project Status	Notable Potential Project Impacts
Communication Towers Project	West and north of SWAT 5 on CMAGR	Establishment of two radio communication towers	The NEPA process has not yet been started.	<ul style="list-style-type: none"> Only negligible impacts due to small project footprint Beneficial impact to training safety
Desert Renewable Energy Conservation Plan	Mojave and Colorado deserts, CA	Provide binding, long-term endangered species permit assurances while facilitating review and approval of renewable energy projects	The Draft EIR/EIS was released in 2014.	<ul style="list-style-type: none"> Impacts to cultural resources and desert tortoise critical habitat Benefits to socioeconomics and GHG
Desert Southwest Transmission Line Project	Near Blythe, CA	118-mile 500 kV transmission line and new substation near the Blythe Energy project to the existing Devers Substation	This project is in operation.	<ul style="list-style-type: none"> Impacts to biological resources
Devers-Palo Verde No. 2 Transmission Line Project	I-10 Corridor from Palm Springs, CA, to Phoenix, AZ	Construction of a new 500/22 kV substation and 111-mile 500 kV transmission line	This project is in operation.	<ul style="list-style-type: none"> Impacts to biological resources, water resources, air quality, and desert tortoise
Gold Wind Basin Project	East of Imperial Sand Dunes in Gold Basin Area	Wind energy testing and development for three meteorological towers on 8,446 acres	ROW authorization expired in 2014.	<ul style="list-style-type: none"> Impacts to biological resources and air quality Beneficial impacts to GHG
Graham Pass	North of CMAGR	Wind energy testing on 30,855 acres	This project is in the planning process.	<ul style="list-style-type: none"> Impacts to biological resources and air quality Beneficial impacts to GHG

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Table 3-2. Cumulative Projects and Potential Impacts (cont.)

Project Name	Project Location	Project Description	Current Project Status	Notable Potential Project Impacts
Green Energy Express Transmission Line Project	West of SR 177 and north of I-10 in Riverside County	70-mile double-circuit 500 kV transmission line and new 500/230 kV substation near the Eagle Mountain substation to southern California	This project is pending.	<ul style="list-style-type: none"> • Impacts to biological resources
Infrastructure Improvements at Camp Billy Machen (P-771)	Near Niland, CA	Utility upgrades, construction of instructional spaces, materials handling and preparation facilities, and berthing	The FONSI was signed in April 2012. A supplemental EA for upgrades has been completed.	<ul style="list-style-type: none"> • Impacts to air quality and desert tortoise
Invader Project	R-2507S on CMAGR	New air-to-ground target complex	The EA/FONSI is complete	<ul style="list-style-type: none"> • Impacts to geological resources including soils and groundwater • Impacts on the desert tortoise
Milpitas Wind Testing Project	Chuckwalla Bench, north Imperial County, CA	Wind energy testing and development for two meteorological towers and a sonic detection and ranging unit on 5,763 acres	This was authorized by BLM.	<ul style="list-style-type: none"> • Impacts to biological resources and air quality • Beneficial impacts to GHG
Mule Mountain III	Mule Mountains	250 MW solar power tower on 8,160 acres	This is in the planning process.	<ul style="list-style-type: none"> • Impacts to biological resources, water resources, and air quality • Beneficial impacts to GHG

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Table 3-2. Cumulative Projects and Potential Impacts (cont.)

Project Name	Project Location	Project Description	Current Project Status	Notable Potential Project Impacts
Ogilby Solar Project	West of Ogilby Road, Imperial County, CA	100 to 250 MW concentrating solar thermal tower facility on 4,000 acres	This is pending authorization. The updated POD and hydrology report have been received by BLM.	<ul style="list-style-type: none"> • Impacts to biological resources and air quality • Beneficial impacts to GHG
Proposed Establishment of Special Use Airspace Restricted Area R-2507W	Airspace overlying SWATs 4 and 5 on CMAGR	Establishment of restricted airspace over SWATs 4 and 5	The FONSI was signed in 2014.	<ul style="list-style-type: none"> • Potential for small increase in bird/bat aircraft strikes
Red Bluff Substation	South of I-10	500/220 kV substation near Desert Center with two new parallel transmission line segments to connect the substation to the Devers-Palo Verde 500 kV transmission line	This is in operation.	<ul style="list-style-type: none"> • Impacts to air quality and biological resources
Shavers Valley/I-10 Corridor	Riverside County	Solar energy development	Pending	<ul style="list-style-type: none"> • Impacts to biological resources, water resources, and air quality • Beneficial impacts to GHG
Sonoran West SEGS	Palo Verde Mesa	540 MW solar power tower located on 12,269 acres	This is in the planning process.	<ul style="list-style-type: none"> • Impacts to biological resources, water resources, and air quality • Beneficial impacts to GHG

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Table 3-2. Cumulative Projects and Potential Impacts (cont.)

Project Name	Project Location	Project Description	Current Project Status	Notable Potential Project Impacts
Sun Peak Solar Farm	Northeast of Niland, CA	Construction of a 23 MW fixed PV solar system	Construction was completed in 2012.	<ul style="list-style-type: none"> • Air quality impacts • Benefits to socioeconomics due to job creation • GHG emissions reduced
West Chocolate Mountains Renewable Energy Evaluation	Near Niland, CA	Evaluated the suitability of geothermal and solar energy development within the West Chocolate Mountains Renewable Energy Evaluation Area.	The ROD was signed in 2012.	<ul style="list-style-type: none"> • Impacts to geological resources, recreation, air quality and desert tortoise critical habitat • Benefits to socioeconomics and GHG

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4.0 SUMMARY OF FINDINGS AND CONCLUSIONS

A summary of potential impacts associated with both alternatives evaluated in this EA is provided in Table 4-1. Based on the analysis contained herein, this EA concludes that neither the implementation of Alternative 1 (Proposed Action) nor the No Action Alternative will constitute a major federal action with significant impact to human health or the environment. It is recommended that a FONSI be issued to complete the analysis under the NEPA.

Table 4-1. Summary of Impacts by Alternative

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP for the CMAGR	No Action Alternative: Retain the 2014 INRMP with No Changes
Land Use	No impacts to land use are expected from the implementation of the Proposed Action. Programs and projects proposed would not change land use and would not result in any new land use incompatibilities. Proposed natural resources management projects would benefit current land use by improving the quality of the training environment.	No impacts to land use are expected.
Topography, Geology, and Soils	No impacts to topography or geology are expected from the implementation of the Proposed Action. Incidental and minimal impacts to soils may occur due to natural resource surveys and direct analysis of soils. Soil conditions may benefit from increased technical knowledge of soil properties and characteristics for the establishment of a monitoring framework for erosion and other soil-related impacts.	No impacts to topography or geology are expected. Incidental and minimal impacts to soils may occur due to natural resource surveys and direct analysis of soils similar to the Proposed Action.
Hydrology and Water Resources	No impacts to hydrological or water resources are expected from the implementation of the Proposed Action. The CMAGR does not contain natural open-water sources. Artificial water sources (guzzlers) will be installed and maintained in accordance with the Proposed Action.	No impacts to hydrological or water resources are expected.

CMAGR – Chocolate Mountain Aerial Gunnery Range; **INRMP** – Integrated Natural Resources Management Plan; **O₃** – ozone; **PM_{2.5}** – particulate matter less than 2.5 microns in diameter; **PM₁₀** – particulate matter less than 10 microns in diameter

Table 4-1. Summary of Impacts by Alternative (cont.)

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP for the CMAGR	No Action Alternative: Retain the 2014 INRMP with No Changes
Biological Resources	The Revised INRMP would have moderate benefits for vegetation communities, general wildlife populations, and special status plant and wildlife species through the implementation of enhanced monitoring and surveying of biological resources. Restoration and maintenance of native habitats would aid in the recovery of listed species and the continued functioning of ecosystems. The addition and maintenance of water sources would have beneficial effects for multiple species. Long-term benefits to all biological resources would occur through proactive natural resource management.	The 2014 INRMP has moderate benefits for vegetation communities, general wildlife populations, and special status plant and wildlife species through the implementation of monitoring and surveying of biological resources. Long-term benefits to biological resources would occur through proactive natural resource management.
Cultural Resources	No significant impacts to cultural resources are expected from the implementation of the Proposed Action. Incidental and minimal impacts to cultural resources may occur due to natural resource surveys. If an unknown cultural resource is discovered on the range, the Cultural Resource Manager would be notified.	No significant impacts to cultural resource are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.
Air Quality	No significant impacts to air quality are expected from the implementation of the Proposed Action. Some activities would result in minor increases in emissions such as fugitive dust and vehicle and equipment exhaust. Equipment usages associated with INRMP implementation projects are not known at this time. Proposed emissions would be significantly below the <i>de minimis</i> thresholds for Imperial and Riverside counties, which are 100 tons per year for O ₃ precursors and 70 tons per year for PM ₁₀ for Imperial County and 25 tons per year O ₃ and 70 tons per year for PM ₁₀ , for Riverside County. Pesticide application would result in minor, temporary impacts to air quality. Overall, impacts would be less than significant and would not contribute significant emissions to local or regional air quality.	No significant impacts to air quality are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.

CMAGR – Chocolate Mountain Aerial Gunnery Range; **INRMP** – Integrated Natural Resources Management Plan; **O₃** – ozone; **PM_{2.5}** – particulate matter less than 2.5 microns in diameter; **PM₁₀** – particulate matter less than 10 microns in diameter

Table 4-1. Summary of Impacts by Alternative (cont.)

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP for the CMAGR	No Action Alternative: Retain the 2014 INRMP with No Changes
Noise	No significant impacts from noise are expected from the implementation of the Proposed Action. Minor infrequent noise increases would be associated with the project vehicles needed to access the range for natural resource surveys and other wildlife management activities.	No significant impacts from noise are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.
Visual Resources	No impacts to visual resources would result from the implementation of the Proposed Action. None of the proposed projects would impact visual resources.	No impacts to visual resources would result.
Socioeconomics	No impacts to socioeconomics are expected from the implementation of the Proposed Action. No permanent residents live and the implementation of the Proposed Action would have no significant impacts on the local economy.	No impacts to socioeconomics would result.
Transportation and Circulation	No significant impacts to transportation and circulation are expected from the implementation of the Proposed Action. A minor, short-term increase in traffic would occur during the implementation of natural resource surveys, but this would not result in any significant impacts.	No significant impacts to transportation and circulation are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.
Utilities	No impacts to utilities are expected from the implementation of the Proposed Action. The Proposed Action would not create any new utilities on the Installation nor would it impact the existing infrastructure.	No impacts to utilities are expected.
Hazardous Materials and Wastes	No significant impacts from the use or storage of hazardous materials and waste are expected from the implementation of the Proposed Action. Pesticides may be used to manage nonnative and invasive plant species. Fire suppressants may be used to mitigate fire danger following a Wildland Fire Management Plan. All use of pesticide and fire suppressants would be minor and infrequent and would follow all regulations and guidelines.	No significant impacts from the use or storage of hazardous materials and waste are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.

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Table 4-1. Summary of Impacts by Alternative (cont.)

Resource Area	Proposed Action (Preferred Alternative): Implementation of the Revised INRMP for the CMAGR	No Action Alternative: Retain the 2014 INRMP with No Changes
Health and Human Safety	No significant impacts to human health or safety are expected from the implementation of the Proposed Action. Law enforcement patrols would increase the safety of the public by limiting access to unexploded ordnance, live fire training, etc. All personnel associated with the implementation of the Proposed Action would be required to comply with applicable health and safety regulations.	No significant impacts to human health or safety are expected. The extent of potential impacts are comparable to those identified under the Proposed Action.

CMAGR – Chocolate Mountain Aerial Gunnery Range; **INRMP** – Integrated Natural Resources Management Plan; **O₃** – ozone; **PM_{2.5}** – particulate matter less than 2.5 microns in diameter; **PM₁₀** – particulate matter less than 10 microns in diameter

5.0 REFERENCES

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Appendix A. Public Review Materials

FORMAT PAGE

AFFP
PUBLIC NOTICE DRAFT REVISION

Affidavit of Publication

STATE OF ARIZONA }
COUNTY OF YUMA } SS

Lisa Reilly or Kathy White, being duly sworn, says:

That she is Publisher or Business Manager of the Yuma Sun, a daily newspaper of general circulation, printed and published in Yuma, Yuma County, Arizona; that the publication, a copy of which is attached hereto, was published in the said newspaper on the following dates:

October 28, 2016, October 29, 2016, October 30, 2016

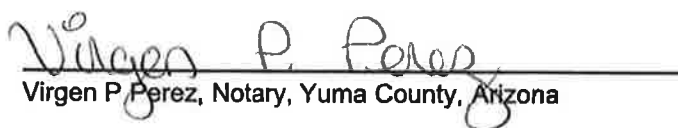
That said newspaper was regularly issued and circulated on those dates.

SIGNED:



Publisher or Business Manager

Subscribed to and sworn to me this 30th day of October 2016.



Virgen P. Perez, Notary, Yuma County, Arizona

My commission expires: May 10, 2017

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PUBLIC NOTICE

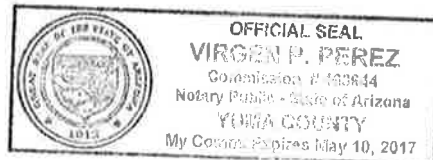
DRAFT REVISION OF THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE, CALIFORNIA

The Department of Navy (DoN) has prepared a Draft Revised Integrated Natural Resources Management Plan (INRMP) for the Chocolate Mountain Aerial Gunnery Range (CMAGR). A Draft Environmental Assessment (EA) was also prepared to analyze the potential for environmental impacts associated with implementation of the INRMP. Pursuant to the National Environmental Policy Act (NEPA), the DoN gives notice that the Draft Revised INRMP and Draft EA are available for public review.

PROPOSED ACTION: The Proposed Action is implementation of the Draft Revised INRMP for the CMAGR. This plan reflects CMAGR's commitment to conserve, protect, and enhance the Installation's natural resources in a manner that supports and enhances realistic military training. The primary objective of the plan is to provide a proactive natural resources management tool that allows DoN to achieve CMAGR resource management goals, mission requirements, and compliance with environmental regulations and policies.

HOW TO REVIEW THE DRAFT INRMP and EA: The Draft Revised INRMP and Draft EA will be available for a 30-day review period commencing with the publication of this notice. Hardcopies are available for review in the Main Branch of the Yuma County Library District (2951 S. 21st Dr., Yuma, AZ 85364) and the City of El Centro Public Library (1140 N. Imperial Ave., El Centro, CA 92243). In addition, the Draft EA and INRMP are also available for electronic viewing via the following website:

<http://www.mcasyuma.marines.mil/Staff-and-Agencies/Range-Natural-and-Cultural-Resources/>
Daily October 28, 29, 30, 2016 - 00104549



PUBLIC NOTICE

DRAFT REVISION OF THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE, CALIFORNIA

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Dear Librarian,

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Please make this document available for public review upon receipt and until at least 15 December 2016. Instructions for the submittal of public comments are included in the document and are due to the Government by no later than 30 November 2016.

Please contact me if you have any questions.

Respectfully,

Michael Collins
Project Manager

Copy: Project Administrative Record



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REGIONAL PROJECT OFFICES:

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19 October 2016

Librarian
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Dear Librarian,

Enclosed please find one (1) hardcopy of the:

DRAFT ENVIRONMENTAL ASSESSMENT FOR THE 2016 REVISED INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN, CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE, CALIFORNIA

We are providing this copy to your library as a repository for federal environmental documentation related to regional federal activities.

Please make this document available for public review upon receipt and until at least 15 December 2016. Instructions for the submittal of public comments are included in the document and are due to the Government by no later than 30 November 2016.

Please contact me if you have any questions.

Respectfully,

Michael Collins
Project Manager

Copy: Project Administrative Record



October 25, 2016

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**Appendix B. Anticipated Levels of Potential Impact
under the Preferred Alternative by Program Area**

FORMAT PAGE

Table B-1. Program Areas – Anticipated Levels of Potential Impact under the Preferred Alternative

Program Area	Action Step	Resource Areas With Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
INRMP Implementation	4.1-1: Prioritize, seek funding for, and implement the INRMP	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NSI	NSI	NSI
	4.1-2: Review the INRMP annually for operation and effect	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
NEPA Review	4.2-1: Provide expert review of potential impacts of federal actions	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
ESA Compliance	4.3-1: Adhere to conservation measures and relevant avoidance measures identified in applicable USFWS BOs	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NSI	NI	NSI
	4.3-2: Manage federal T&E species and their habitats to prevent jeopardy and assist in their recovery	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NSI	NI	NSI
	4.3-3: Manage federal T&E species to minimize impacts to both mission and species	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI

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Program Area	Action Step	Resource Areas With Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	4.3-4: Proactively collect information on federal T&E species	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.3-5: Develop and maintain a robust GIS for federal T&E species data	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Threatened or Endangered Species, Critical Habitat	4.4-1: Continue participation in annual desert tortoise surveys	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.4-2: Map desert tortoise population densities, and habitat across the range	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.4-3: Continue to participate in the Desert Tortoise Management Oversight Group and the California Recovery Implementation Team. Develop project proposals to assist with the species recovery.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.4-4: Pending decisions of other State and Federal lead agencies, determine whether the reintroduction of a nonessential experimental population of Sonoran pronghorn will be compatible with training	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI

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		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	mission objectives and designed to avoid conflicting with range operations.													
	4.4-4: Assist in the coordination and provide in-kind and financial support, if available, to the Sonoran pronghorn recovery team	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Other Special Status Species	4.5-1: Inventory and monitor special status species to establish a baseline from which conservation and management strategies can be devised	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
Migratory Birds and Eagles	4.6-1: Avoid or minimize impacts to migratory birds and eagles and their habitat	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.6-2: Conduct monitoring surveys periodically as part of an adaptive management strategy to better inform migratory bird management on the range.	NI	NSI	NI	NI	NSI	NSI	NI	NI	NI	NI	NI	NI	NSI
	4.6-3: Develop, implement, and evaluate conservation measures for management actions to avoid or minimize incidental take of migratory birds and eagles	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI

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Program Area	Action Step	Resource Areas With Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	4.6-4: Participate In regional or national inventory and monitoring programs	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
BASH Program	4.7-1: Maintain the existing MBTA depredation permit(s)	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.7-2: Update as necessary and periodically evaluate possible improvements to the BASH Program	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
General Wildlife	4.8-1: Inventory and monitor distribution and abundance of reptiles, birds, amphibians, and small mammals	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.8-2: Maintain vegetation known to support wildlife	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.8-3: Restore or enhance vegetation outside of heavy-use areas	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NSI	NI	NSI
	4.9-1: Work in partnership with BLM to control the wild burro populations	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI

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Program Area	Action Step	Resource Areas With Associated Levels of Potential Impact												
		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
Nonnative and Nuisance Wildlife	4.9-2: Inventory, monitor, and control raven populations	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.9-3: Develop pest species management programs as needed to include pest mammals such as rabbits, skunks, raccoons, squirrels, coyotes, feral dogs, feral cats, and pest birds	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NSI	NI	NSI
Vegetation	4.10-1: Complete vegetation mapping	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.10-2: Identify essential habitats for rare plants and wildlife	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Invasive and Nonnative Plant Species	4.11-1: Acquire reliable baseline data on the presence and abundance of invasive and nonnative plant species	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.11-2: Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI

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		Land Use	Topography, Geography, Soils	Hydrology and Water Resources	Cultural Resources	Air Quality	Noise	Visual Resources	Socioeconomics	Transportation and Circulation	Utilities	Hazardous Waste and Materials	Health and Human Safety	Biological Resources
	4.11-3: Treatment of areas most likely to impact ecosystem health or mission readiness	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NSI	NSI	NSI
Wildland Fire Management	4.12-1: Develop and implement a WFMP	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NSI	NSI	NSI
Wildlife Watering Sources	4.13-1: Maintain access to the guzzlers along the Coachella Canal to allow large mammals to move onto and off the CMAGR to use these guzzlers.	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
Ecosystem Management	4.14-1: Support research to gain the best available scientific information to guide natural resource and conservation decisions	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.14-2: Define and understand the CMAGR's regional relevance and responsibility towards regional conservation efforts	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.14-3: Update aerial orthographic photographs over time to determine a	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

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	baseline and to document landscape changes													
	4.14-4: Utilize aerial orthographic imagery to conduct anthropogenic-impact-specific studies	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Soils	4.15-1: Establish a soils and erosion monitoring framework to measure and assess changes to soil resources over time	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.15-2: Assess current erosion status within the watershed and evaluate possible engineering management practices that will mitigate erosion	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
	4.15-3: Develop spatial data related to soil associations and characteristics	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NI	NSI
Climate Change	4.16-1: Conduct an assessment of sustainability objectives and strategies in the context of climate change relevant to natural resources	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

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	4.16-2: Conduct vulnerability assessments of species and habitats most at risk, coordinating with other DoD installations for guidance	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.16-3: Collaborate with DoD mission leads, wildlife agencies, and other relevant partners to optimize the value of strategies developed for adaptation to climate change	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.16-4: Install and maintain weather stations, including rain gauges at specific study locations	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI
Conservation Division GIS	4.17-1: Continue development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils	NI	NSI	NI	NSI	NSI	NI	NI	NI	NSI	NI	NI	NI	NSI

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Cooperative Initiatives	4.18-1: Maintain cooperation with internal stakeholders (i.e., Environmental, Installations and Logistics, and Planning), and neighboring installations on natural resource management issues of mutual interest	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4.18-2: Maintain regular contact and coordination with cooperating agencies, coordinating agencies, and other external stakeholders.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Law Enforcement	4.19-1: Establish and maintain adequate control measures (e.g., signs, gates, fences, etc.) to provide for security, safety, and protection of natural resources	NI	NSI	NI	NSI	NSI	NSI	NI	NI	NSI	NI	NI	NSI	NSI

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Appendix G. Agreements

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Appendix H. Findings of No Significant Impacts and Records of Decision

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**INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
FOR THE CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE, CALIFORNIA**

APPROVING AGENCY

This Integrated Natural Resources Management Plan for the Chocolate Mountain Aerial Gunnery Range was prepared by Marine Corps Air Station Yuma, Arizona with technical assistance from the United States (U.S.) Department of the Navy Naval Facilities Engineering Command Southwest. This plan is prepared in cooperation with the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife in accordance with the 2013 *Memorandum of Understanding for a Cooperative Integrated Natural Resources Management Program on Military Installations* (U.S. Department of Defense, U.S. Fish and Wildlife Service, and Association of Fish and Wildlife Agencies 2013)

Sikes Act (16 UNITED STATES CODE 670a)

This Integrated Natural Resources Management Plan is consistent with the use of military installations to ensure the preparedness of the Armed Forces and fulfills the requirements of the Sikes Act (16 United States Code Section 670a, *et seq.*) as amended, for the Chocolate Mountain Aerial Gunnery Range.

Signature on this Integrated Natural Resources Management Plan constitutes a commitment to seek funding and execute, subject to the availability of funding, all "must fund" projects and activities in accordance with the timeframes identified (MCO P5090.2A w/changes 1-3 [HQMC 2013]).

Approving Official: U.S. Marine Corps, Marine Corps Air Station Yuma



COLONEL RICARDO MARTINEZ
Commanding Officer
Marine Corps Air Station Yuma, Arizona

20170623

Date

FINDING OF NO SIGNIFICANT IMPACT
REVISION OF THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE, CALIFORNIA

MARCH 2017

Pursuant to the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508) implementing procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code §§ 4321-4370h); Department of the Navy (DoN) procedures for implementing NEPA (32 CFR Part 775); and Marine Corps Order P5090.2A, Change 3, dated 26 August 2013, *Environmental Compliance and Protection Manual*, the DoN gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement (EIS) will not be prepared for the proposed implementation of the Revised Integrated Natural Resources Management Plan (INRMP) for the Chocolate Mountain Aerial Gunnery Range (CMAGR) in Imperial County, California.

Purpose and Need: On 26 December 2013, President Barack Obama signed FY14 NDAA, Title XXIX, Subtitle E, of the FY14 NDAA directed the Bureau of Land Management (BLM) to transfer administrative jurisdiction to the DoN for 228,324 acres (357 square miles) of land previously withdrawn in support of the military operations at the CMAGR. The northwest boundary was realigned to the edge of the Bradshaw Trail so the trail is entirely on public land under the jurisdiction of BLM. The DoN relinquished to BLM 629 acres of DoN land and 1,960 acres of BLM land, withdrawn for military use, that are immediately north of the Bradshaw Trail. BLM will manage the land in accordance with the applicable Land Use Plan developed under Section 202 of the Federal Land Policy and Management Act of 1976, Title 43, United States Code (U.S.C.) 1712.

The 2014 CMAGR INRMP was revised to satisfy the FY14 NDAA and to integrate updates to natural resources management programs and strategies at the CMAGR. The Revised INRMP provides a long-term strategy to coordinate all natural resources management activities and allows for sustainable multipurpose use of the resources. The Revised INRMP's objectives are to manage natural resources and military use so there is no net loss of the CMAGR's ability to support its military purposes in a manner consistent with Department of Defense (DoD) ecosystem management principles. Further, management prescribed by the revised INRMP benefits threatened and endangered species on the CMAGR consistent with federal and state recovery actions for these species under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531, *et seq.*).

Description of the Proposed Action: The Proposed Action is the implementation of the Revised INRMP. This plan reflects CMAGR's commitment to conserve, protect, and enhance the Installation's natural resources in a manner that supports and enhances realistic military training. The primary objective of the plan is to provide a proactive natural resources management tool that allows MCAS Yuma to achieve CMAGR resource management goals, mission requirements, and compliance with environmental regulations and policies.

Alternatives Considered: Two alternatives, the Preferred Alternative and a No Action Alternative, were evaluated for their potential direct, indirect, and cumulative impacts on the human environment.

The Preferred Alternative (Proposed Action) would involve the full implementation of the INRMP, as required by law. This alternative would meet regulatory requirements, and provide information, guidance, and standard operating procedures to MCAS Yuma staff to ensure the successful management and protection of the Installation's natural resources.

The No Action Alternative is required under the CEQ regulations that implement the NEPA process and serves as a baseline or benchmark to compare to the Proposed Action and alternatives. Under the No Action Alternative, the Revised INRMP for the CMAGR would not be implemented, and management activities currently being conducted under the 2014 INRMP would continue. While this alternative would meet most regulatory requirements and provide guidance and standard operating procedures to MCAS Yuma staff, it would provide less information and fewer benefits to the CMAGR's natural resources. Furthermore, operating under the 2014 INRMP would not meet the congressional mandate of the FY14 NDAA to complete a Revised INRMP.

Additional Alternatives: The DoN considered the Preferred Alternative and the No Action Alternative during the NEPA process. No other alternatives are analyzed in the EA.

Anticipated Environmental Effects: The EA analyzed the environmental impacts that would potentially result from implementation of the Proposed Action (Preferred Alternative) and the No Action Alternative. An initial impact evaluation found that the extent of potential impacts to the majority of resources was not measurable, was negligible, or was clearly less than significant. Those resources include: land use; geology, topography, and soils; hydrology and water resources; air quality; cultural resources; noise; visual resources; socioeconomics; transportation and circulation; utilities; hazardous materials and waste; and human health and safety. Biological resources were analyzed in depth within the EA.

Based on information gathered and presented in the EA, it has been determined that implementation of either the Proposed Action (Preferred Alternative) or the No Action Alternative would have no significant direct, indirect, or cumulative adverse impacts on the environment. Adverse impacts associated with implementing the Proposed Action would be minor in context and intensity, and mostly temporary. Long-term, beneficial impacts would be expected as a result of many of the natural resources management activities in the INRMP.


Agency Coordination and Public Involvement: Both the USFWS and the CDFW were invited to review and comment on an early draft of the Revised INRMP and EA. The October 2016 Draft Revised INRMP, Draft EA and a draft copy of this Finding of No Significant Impact (FONSI) were made available to the general public and applicable government agencies for review and comment during a 30-day period that commenced with the publication of a Notice of Availability in the Yuma Sun Newspaper on 28, 29 and 30 October 2016. Copies of the October 2016 Draft Revised INRMP, Draft EA, and Draft FONSI along with instructions for

submitting comments were made available at the following public libraries: Yuma County Library District, Main Branch, 2951 S. 21st Drive, Yuma, Arizona 85364, and City of El Centro Public Library, 1140 N. Imperial Avenue, El Centro, California 92243; and online at <http://www.mcasyma.marines.mil/Staff-and-Agencies/Range-Natural-and-Cultural-Resources/>.

Public and Agency Comments: There were no comments received on the Draft Environmental Assessment during the 30-day review period. Comments on the Draft INRMP were received from Pete Sorenson, Jody Fraser, and Kerry Holcomb of the U.S. Fish and Wildlife Service (USFWS) and Jack Crayon of the California Department of Fish and Wildlife (CDFW) recommending 1) revisions to the Desert Tortoise Management Plan, 2) very minor revisions to the document to provide additional detail on the availability of survey data used to support the plan, 3) minor corrections to species names and potential occurrences on the range, and 4) minor changes to the 5-Year Action Plan. All comments were addressed in the Final INRMP and did not result in any additional anticipated environmental impact. Therefore, the conclusions of the Draft EA remained without revision and no substantive changes were made in the Final EA.

Findings: Based on the analysis contained in the EA, I have selected implementation of the Proposed Action, the DoN's Preferred Alternative, and find that it will have no significant impact on the human environment. This Finding of No Significant Impact is based on the attached EA which has been independently evaluated by the DoN, and determined to adequately and accurately discuss the purpose and need, the alternatives, environmental issues, and impacts of the Proposed Action. Consequently, implementation of the Proposed Action does not require the preparation of an Environmental Impact Statement.

Approved By:



COLONEL RICARDO MARTINEZ
Commanding Officer
Marine Corps Air Station Yuma

20170623

Date

**DEPARTMENT OF DEFENSE
UNITED STATES MARINE CORPS
FINDING OF NO SIGNIFICANT IMPACT
FOR PROPOSED RANGE REDESIGN OF SPECIAL WARFARE TRAINING AREAS 4 AND 5
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
IMPERIAL AND RIVERSIDE COUNTIES, CALIFORNIA**

Pursuant to the Council on Environmental Quality regulations (40 Code of Federal Regulations Parts 1500-1508) implementing procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code §§ 4321-4370h); Department of the Navy procedures for implementing NEPA (32 CFR Part 775); and Marine Corps Order P5090.2A, Change 3, dated 26 August 2013, *Environmental Compliance and Protection Manual*, the U.S. Marine Corps (USMC) gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement (EIS) will not be prepared for the proposed range redesign of Special Warfare Training Areas (SWATs) 4 and 5 located within the Chocolate Mountain Aerial Gunnery Range (CMAGR) in Imperial and Riverside counties, California (CA).

Background: SWATs 4 and 5 are two ground warfare training areas located within the western portion of the CMAGR. The CMAGR is primarily used for live-fire aviation and ground warfare training conducted by USMC and Navy forces. The Proposed Action is required to accommodate increased training demands within SWATs 4 and 5. The existing ranges within SWATs 4 and 5 are decades old and were more accustomed to use when there were fewer Special Operations Forces personnel utilizing them. The current configurations of SWATs 4 and 5 do not support concurrent training by multiple units training for different missions. Further, training value has become reduced due to range users' familiarity of target areas and live-fire and maneuver (LFAM) ranges that have not evolved and lack training diversity.

The purpose of the Proposed Action is to increase training throughput and maximize range use capabilities within SWATs 4 and 5 at the CMAGR. The Proposed Action is needed because the current configuration of SWATs 4 and 5 do not provide sufficient throughput capacity, the ability for multiple units to conduct simultaneous training, or the flexibility to meet evolving operational requirements.

Proposed Action: Under the Proposed Action, the existing static range configurations within SWATs 4 and 5 would be reconfigured to create new and improved ranges, range facilities, training capabilities, and new or improved access roads. The existing high hazard impact area (HHIA) would be deactivated and repurposed following unexploded ordnance (UXO) clearance. The resulting range and training areas (RTAs) would enhance the training efficiencies of the static ranges and would maximize the utility of the LFAM ranges, thereby optimizing training opportunities. All firing points would be located within SWATs 4 and 5. The proposed HHIA and associated surface danger zones (SDZs) would extend from the eastern boundary of SWAT 4 into the adjacent portion of the CMAGR in R-2507N. Implementation of the Proposed Action would facilitate maintaining Naval Special Warfare, USMC, and other forces at an optimal state of readiness to support current and emerging contingency and wartime requirements.

Alternatives: The EA analyzed the potential environmental effects of three alternatives: Alternative 1, Alternative 2, and the No-Action alternative. Under Alternative 1, SWATs 4 and 5 ranges would be reconfigured, resulting in 11 fixed LFAM ranges (7 dismounted and 4 mounted/dismounted), 14 fixed LFAM target areas, 13 static ranges, 1 new HHIA, and construction of new access roads. Also included would be modifications to existing RTAs and authorization of off-road vehicle driving and maneuvering by tactical vehicles (subject to avoidance, minimization and mitigation measures [AMMMs]). Dismounted (foot) movements would continue to be authorized in all areas of SWATs 4 and 5. Alternative 2 provides the same elements as presented under Alternative 1, with the addition of enhanced training flexibility by authorizing mounted LFAM training throughout SWATs 4 and 5, unlike Alternative 1, which would constrain mounted LFAM training to specified areas. There would be no change to the existing SWATs 4 and 5 boundaries under either action alternative. Under the No-Action alternative, training would continue at existing levels and in existing ranges/maneuver areas. Consequently, the potential training benefits of SWATs 4

and 5 would not be realized and the situation would continue to affect the capability of forces to achieve additional enhanced training requirements.

Summary of Environmental Effects: The EA analyzed the environmental impacts that would potentially result from the implementation of Alternative 1, Alternative 2, and the No-Action alternative. The resources that had the most potential to be affected by the alternatives, and were analyzed in-depth in the EA, included: geology and soils, water resources, biological resources, cultural resources, public health and safety, air quality, and noise.

Geology and Soils: The Proposed Action would have a less than significant impact on geology and soils. There would be alterations to topographic features from cut and fill as well as crushing of soil crusts and compacting of soils; however, the resulting topography would maintain existing runoff patterns. An increase in erosion as well as lead and munitions constituent (MC) concentrations in soil would occur; however, periodic mining of the impact berms would occur, thus reducing the potential for long-term accumulation of expended munitions, such as lead.

Water Resources: The Proposed Action would have a less than significant impact on water resources. Ephemeral channels would be altered but their hydrologic function would not change. Increased runoff, erosion, turbidity, and sedimentation would occur. There would be direct impacts to approximately 0.84 acre (0.34 hectare [ha]) of ephemeral washes. The USMC is actively coordinating with the USACE regarding the jurisdictional status of the ephemeral drainages within the project area. Subject to the pending USACE jurisdictional determination, the USMC would obtain any necessary permits prior to construction.

Biological Resources: The Proposed Action would have a less than significant impact on biological resources. Approximately 115 acres (47 ha) of plant community types would be permanently impacted by construction. All plant communities and habitats in SWATs 4 and 5 and the HHIA (34,770 acres [14,070 ha]) would potentially be disturbed and degraded by mounted and dismounted training, use of explosives, and/or other training related activities. There would be adverse effects to the desert tortoise with the potential for takes. However, implementation of AMMMs and other requirements stated in the U.S. Fish and Wildlife Service (USFWS) Biological Opinion would minimize potential for impacts to biological resources, including the desert tortoise.

Cultural Resources: The Proposed Action would have a less than significant impact on cultural resources. Implementation of measures as stated in the Programmatic Agreement would ensure proper consideration and treatment of historic properties.

Public Health and Safety: The Proposed Action would have a less than significant impact to public health and safety. There would be increased potential of UXO and MCs concentrations within the project area; however, no increase in public health and safety risk. All SDZs would be within the CMAGR. Fences, gates, signs, and regular range maintenance/removal of mobile targets would reduce potential for trespassing in training areas, reducing risk to public health and safety.

Air Quality: The Proposed Action would have a less than significant impact to air quality. There would be a decrease in fugitive dust emissions compared to existing conditions due to the application of dust palliative that would help control the extent and severity of fugitive dust emissions from training. Combined construction and operational emissions would be less than *de minimis* levels for all criteria pollutants.

Noise: The Proposed Action would have a less than significant impact to existing noise. There would be an increase in aircraft and ordnance noise levels; however, the increase would not exceed recognized significance thresholds and the noise would be consistent with the existing noise environment (i.e., no new noise sources).

None of the alternatives analyzed in the EA would result in significant direct or indirect impacts on the quality of the local environment. The Proposed Action could potentially contribute cumulative impacts on air quality, particularly particulate matter less than or equal to 2.5 and 10 microns in diameter. No other cumulative impacts would result.


Agency Coordination and Public Involvement: In accordance with Section 7 of the Endangered Species Act, the USMC initiated consultation with the USFWS. The USFWS issued an amendment to the 1996 Programmatic Biological Opinion on 9 November 2015. In accordance with Section 106 of the National Historic Preservation Act, the USMC initiated consultation with the State Historic Preservation Officer and Tribal Governments, and a Programmatic Agreement was signed on 17 February 2016.

A notice of availability for the review of the Public Draft EA was published in the two local newspapers: the Imperial Valley Press on 29, 30 and 31 May 2015, and the Adelante Valle (Spanish language newspaper) on 29 May 2015. The 30-day public comment period was from 29 May to 29 June 2015. The USMC did not receive any comments during the public review period.

Avoidance, Minimization and Mitigation Measures: The EA identified several AMMMs for the Proposed Action. The measures are reflective of Section 7 and Section 106 consultations.

Findings: After careful review of the EA, I have selected to implement Alternative 2, and find that it will have no significant impact on the human environment. This finding of no significant impact is based on the attached EA, which has been independently evaluated by the USMC, and determined to adequately and accurately discuss the need, environmental issues, and impacts of the Proposed Action. The EA provides sufficient evidence and analysis for determining that an EIS is not required.

The EA addressing this Proposed Action may be obtained by contacting Mr. Jesse Martinez, NEPA Project Manager, at Naval Facilities Engineering Command Southwest, 1220 Pacific Highway, Building 1 Central IPT, San Diego, CA 92132, or via email at jesse.w.martinez1@navy.mil.



RICARDO MARTINEZ

Colonel, U.S. Marine Corps
Commanding Officer
Marine Corps Air Station Yuma

20160324

Date

**DEPARTMENT OF DEFENSE
UNITED STATES MARINE CORPS
FINDING OF NO SIGNIFICANT IMPACT
FOR ESTABLISHMENT AND USE OF TRAINING SUPPORT AREAS
IN THE BOB STUMP TRAINING RANGE COMPLEX
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE AND
BARRY M. GOLDWATER RANGE-WEST
IMPERIAL COUNTY, CALIFORNIA AND
YUMA COUNTY, ARIZONA**

In accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code §§ 4321-4370h), as implemented by the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] §§ 1500-1508); Department of the Navy procedures for implementing NEPA (32 CFR § 775); and Marine Corps Order 5090.2, dated 11 June 2018, *Environmental Compliance and Protection Program*, the U.S. Marine Corps (USMC) gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement (EIS) will not be prepared for the establishment and use of landing zones (LZs), an assault landing zone (ALZ), drop zones (DZs), and an artillery firing area (AFA) at the two tactical ranges within the Bob Stump Training Range Complex (BSTRC): the Chocolate Mountain Aerial Gunnery Range (CMAGR), California and the Barry M. Goldwater Range (BMGR)-West, Arizona.

Purpose of and Need: The purpose of the Proposed Action is to optimize mission-critical training capabilities within the BSTRC for Marine Corps and Naval aviators and Marine Air-Ground Task Force artillery cannoneers (ground troops who fire artillery). The Proposed Action is needed to establish LZs, an ALZ, DZs, and an AFA at the BSTRC, which would provide MV-22 aircraft similar flexibility to existing Legacy Rotary-Wing Aircraft Policy and Procedures and provide a safer and more realistic artillery firing training environment. The Proposed Action is also needed to accomplish critical Marine Corps and Naval Tactical Training Procedures, Training and Readiness Codes, and Large Force Exercises.

Proposed Action: Under the Proposed Action, the USMC proposes to establish and use LZs, an ALZ, DZs, and an AFA at the BSTRC. The USMC would not increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC as part of the Proposed Action. Implementation of the Proposed Action would facilitate maintaining Marine Corps and other forces at an optimal state of readiness to support current and emerging contingency and wartime requirements.

Alternatives: The USMC considered multiple potential action alternatives for implementing the Proposed Action; however, as presented in the EA, after careful consideration none of the potential alternatives would meet the purpose and need of the Proposed Action. Therefore, the EA analyzed the Proposed Action and the No-Action Alternative in detail.

Under the No-Action Alternative, the USMC would not establish the proposed LZs, ALZ, DZs, and AFA within the BSTRC. Consequently, training challenges at the CMAGR and BMGR-West would persist. This situation would continue to affect the capability of forces to achieve training requirements needed to support current and emerging contingency and wartime requirements. The EA includes the No-Action Alternative as a baseline for comparison to the Proposed Action for determining project effects.

Summary of Environmental Effects: The EA analyzed the environmental impacts that would potentially result from the implementation of the Proposed Action and the No-Action Alternative. The Proposed Action

FINDING OF NO SIGNIFICANT IMPACT

ESTABLISHMENT AND USE OF TRAINING SUPPORT AREAS IN THE BOB STUMP TRAINING RANGE COMPLEX

had the most potential to affect the following resources, which were consequently analyzed in-depth in the EA: air quality, biological resources, cultural resources, and geological resources. Potential impacts to all other resource areas were determined to be negligible or non-existent from implementation of the Proposed Action.

Air Quality: The Proposed Action would not have a significant impact on air quality. Windblown dust generated by the Proposed Action would be negligible. Air quality impacts from the Proposed Action would not exceed any conformity *de minimis* thresholds for the Salton Sea Air Basin. A Record of Non-Applicability for Clean Air Act General Conformity requirements has been prepared and approved for the Proposed Action.

Biological Resources: The Proposed Action would not have a significant impact on biological resources. Approximately 58 acres of desert scrub/wash vegetation would be permanently impacted by grading at the CMAGR. Vegetation and wildlife would temporarily be impacted during training activities, including landings/takeoffs of MV-22s. The desert tortoise would be adversely affected; however, all applicable terms, conditions, and measures identified in previous and recent consultations with the U.S. Fish and Wildlife Service, including the 1996 Biological Opinion and the amendment to the 1996 Biological Opinion issued for the Proposed Action on 24 January 2022, would be implemented to minimize impacts to the desert tortoise.

Cultural Resources: The Proposed Action would not impact historic properties and would therefore not have a significant impact on cultural resources. The EA did not identify any resources of traditional knowledge within the project area. The Proposed Action would have no impact on archaeological resources or historical buildings or structures.

Geological Resources: The Proposed Action would not have a significant impact on geological resources. Grading and training activities would result in surface soil disturbance and a potential localized increase in erosion. The overall impact to topography would be minimal as the topography of the project area is relatively flat.

Conclusion: The Proposed Action will not result in significant impacts on the quality of the local environment. There will not be any disproportionate high and adverse human health or environmental effects from the Proposed Action on minority or low-income populations. Nor will there be any impacts associated with the protection of children from environmental health and safety risks. Therefore, and with incorporation of the conservation measures identified in the EA, impacts to all resources will not be significant with implementation of the Proposed Action.

Agency Coordination and Public Involvement: MCAS Yuma completed Endangered Species Act section 7 consultation for the Proposed Action with the U.S. Fish and Wildlife Service on 24 January 2022 via a Biological Opinion Amendment to the 1996 Biological Opinion. The EA reflects the inclusion of conservation measures identified in the 1996 and 2022 Biological Opinions. In accordance with section 106 of the National Historic Preservation Act, the USMC initiated consultation with the Arizona and California State Historic Preservation Officers (SHPOs) and regional federally recognized Tribal Nations. The SHPOs concurred with MCAS Yuma's determinations of eligibility and finding of No Historic Properties Affected. Therefore, MCAS Yuma has completed the Section 106 process in accordance with 36 CFR 800.4(d)(1).

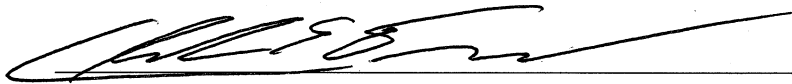
FINDING OF NO SIGNIFICANT IMPACT
ESTABLISHMENT AND USE OF TRAINING SUPPORT AREAS IN THE BOB STUMP TRAINING RANGE
COMPLEX

MCAS Yuma received a request from the Quechan Tribal Nation to include cultural sensitivity training as a conservation measure in the EA. Accordingly, MCAS Yuma included a conservation measure as part of the Proposed Action to continue to provide cultural sensitivity training for all personnel accessing the BSTRC.

The USMC published a notice of availability for the review of the Public Draft EA in the Imperial Valley Press on 6, 7, and 8 August 2021, in the Yuma Sun on 6, 7, and 8 August 2021, and in the Adelante Valle (Spanish language newspaper) on 6, 13, and 20 August 2021. The 15-day public comment period was from 6 August to 21 August 2021. The USMC did not receive any comments during the public review period.

Findings: After careful review of the EA, I have selected to implement the Proposed Action, and find that it will have no significant impact on the human environment. This finding of no significant impact is based on the attached EA. The EA provides sufficient evidence and analysis for determining that an EIS is not required.

The EA addressing this Proposed Action may be obtained by contacting Mr. Jesse Martinez, Senior NEPA Planner/Project Manager, Naval Facilities Engineering Systems Command Southwest, 750 Pacific Highway, Floor 12, San Diego, CA 92132, telephone (619) 705-5573.



CHARLES E. DUDIK

Colonel, U.S. Marine Corps
Commanding Officer
Marine Corps Air Station Yuma

27 Apr 22

Date

Appendix I. Wildland Fire Management Plan

FORMAT PAGE

FINAL

INTEGRATED WILDLAND FIRE MANAGEMENT PLAN
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
Marine Corps Air Station Yuma
Yuma, Arizona

Contract Number N62473-14-D-1424
Contract Task Order N6247317F4047

Hercules JV Project No. 1455404047

November 2018

Submitted to:



Naval Facilities Engineering Command, Southwest
1220 Pacific Highway
San Diego, California 92132-5190

Submitted by:



Hercules Joint Venture (JV)
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Final

Integrated Wildland Fire Management Plan for the Chocolate Mountain Aerial Gunnery Range Marine Corps Air Station Yuma

November 2018

Prepared for:

Marine Corps Air Station Yuma
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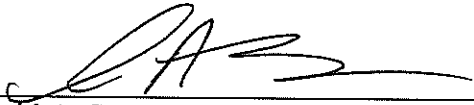
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INTEGRATED WILDLAND FIRE MANAGEMENT PLAN

Chocolate Mountain Aerial Gunnery Range
Imperial and Riverside Counties, California

APPROVAL

This Integrated Wildland Fire Management Plan (IWFMP) meets the requirements of the Integrated Natural Resources Management Plan, Fiscal Years 2017-2022. The plan complies with Department of Defense Instruction (DoDI) 6055.06, MCO 5090.2, and the Sikes Act (16 USC 670a-670o, 74 Stat. 1052, As Amended through P.L. 113-291, Enacted December 19, 2014).



David A. Suggs
Colonel, USMC
Commanding Officer
Chocolate Mountain Aerial Gunnery Range
Marine Corps Air Station Yuma, AZ

12 Dec 2018
Date

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APPENDIX A. MUTUAL AID AGREEMENT BETWEEN IMPERIAL COUNTY FIRE DEPARTMENT AND MCAS YUMA (2016)
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ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CDWR	California Department of Water Resources
CMAGR	Chocolate Mountain Aerial Gunnery Range
CLEO	Conservation Law Enforcement Officer
CM	Conservation Manager
CO	Commanding Officer
CPR	Cardio-Pulmonary Resuscitation
DoD	Department of Defense
DoDI	Department of Defense Instruction
EPA	Environmental Protection Agency
FMD	Facilities Maintenance Division
HQMC	Marine Corps Headquarters
IC	Incident Commander
ICFD	Imperial County Fire Department
INRMP	Integrated Natural Resource Management Plan
ISDRA	Imperial Sand Dunes Recreational Area
IWFMP	Integrated Wildland Fire Management Plan
JDOMS	Joint Directorate of Military Support
LBS	Pounds
MCAS	Marine Corps Air Station
MCIWest	Marine Corps Installations West
MCO	Marine Corps Order
MIST	Minimum Impact Suppression Tactics
MLWA	Military Lands Withdraw Act
NAVFAC SW	Naval Facilities Engineering Command Southwest
NFIRS	National Fire Incident Reporting System
NEPA	National Environmental Policy Act
NFPA	National Protection Association
NIFC	National Fire Interagency Fire Center
NRCS	Natural Resources Conservation Service
NWCG	National Wildfire Coordinating Group
ROI	Region of Influence
SSAB	Salton Sea Air Basin
UPRR	Union Pacific Railroad
WFMP	Wildland Fire Management Plan
WRCC	Western Regional Climate Center

EXECUTIVE SUMMARY

This Integrated Wildland Fire Management Plan (IWFMP) provides the justification and foundation of a fire management program for the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The plan's focus is to provide recommendations for minimizing the threat of wildfire on the approximately 457,760 acres that comprise the CMAGR while following management objectives, and to outline a methodology for the implementation of these recommendations.

This IWFMP analyzes the level of risk posed by wildland fire in order to provide recommendations regarding fire suppression. It also addresses wildfire occurrences in the range training areas, necessary pre-fire preparations, wildfire control methods, and coordination among multiple fire-fighting entities.

Wildland fires on military lands are a risk to human lives, natural resources, military assets, and the military mission. However, wildfires have not been and do not present a significant concern on this range. More than seventy-five percent of the range is classified as unburnable; no fires are expected to burn with flames longer than eight feet. There has been meager history of wildfire in the records for the range. In case of a wildfire, firefighting personnel are provided by a Mutual Aid Agreement between the Imperial County Fire Department (ICFD) and the Marine Corps Air Station (MCAS) Yuma.

The IWFMP describes the actions to be taken and defines the responsibilities of all offices, departments, and agencies involved. It includes information about land use and current biotic and abiotic conditions, fuels, weather, values at risk, relevant policies, organization, and specifics on pre-suppression and maintenance actions.

This IWFMP satisfies the requirement for a wildland fire management plan as established in the Federal Wildland Fire Management Policy. The plan complies with Department of Defense Instruction (DoDI) 6055.06, MCO 5090.2, and the Sikes Act (16 USC 670a-670o, 74 Stat. 1052, As Amended Through P.L. 113–291, Enacted December 19, 2014).

The IWFMP recommends the establishment and strengthening of cooperative agreements for wildland fire response. It also recommends that wildland fuels be monitored after years where exceptional rainfall has occurred.

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1.0 INTRODUCTION

The purpose of this Integrated Wildland Fire Management Plan (IWFMP) for the Chocolate Mountain Aerial Gunnery Range (CMAGR) is to provide a foundation for wildfire suppression options. Public Land Order 7861 transferred jurisdiction of the public lands within the CMAGR to the Department of Navy, effective May 2nd, 2017. As a result, the entire CMAGR is a range managed by Marine Corps Air Station (MCAS) Yuma, Arizona. Wildland fires on military lands are a risk to human lives, natural resources, military assets, and military mission. With that said, wildfires have not been and do not present a significant concern on this range.

This IWFMP analyzes the level of risk posed by wildland fire in order to provide recommendations regarding fire suppression. It also addresses wildfire occurrences in the range training areas, wildfire control methods, and coordination among multiple fire-fighting entities.

Another purpose of this IWFMP is to satisfy the requirement for a wildland fire management plan as established in the Federal Wildland Fire Management Policy by the statement, “Every area with burnable vegetation must have an approved Fire Management Plan. Fire Management Plans are strategic plans that define a program to manage wildland fires based on the area’s approved land management plan” (National Wildfire Coordinating Group (NWCG) 2009). This plan was developed to comply with Department of Defense Instruction (DODI) 6055.06, MCO 5090.2, and the Sikes Act, as amended.

The goal of this IWFMP is to provide for firefighter and public safety and to maximize military training operations, prior to and during wildland fire events. It provides specific guidance, procedures, and protocols for the management of wildland fires on all CMAGR lands. This plan defines the responsibilities of the offices, departments, and agencies involved, and describes fire pre-suppression and suppression actions to be taken on a strategic as well as tactical basis.

1.1 Planning Considerations and Authority

The Federal Wildland Fire Management Policy sets forth the guiding principle that, “Fire Management Plans, programs, and activities support land and resource management plans and their implementation (NWCG, 2009).” The CMAGR Integrated Natural Resources Management Plan (INRMP) is the plan that this IWFMP supports.

The Final INRMP (dated February 2017) states, “In accordance with DoDI 6055.06, MCO 5090.2, and the Sikes Act, a Wildland Fire Management Plan (WFMP) will be developed for the CMAGR to assess the risks to natural resources and military training.” The INRMP states that the objective is to conduct wildland fire management on the CMAGR, with a metric to reduce wildfire potential, protect military assets, and protect and enhance natural resources.

The INRMP provides one action, which is to “Develop and implement a WFMP that identifies regional fire attributes and guidance for managing wildfires. The WFMP development will be a collaborative effort with local firefighting agencies, a fire ecologist, and MCAS Yuma Conservation Program. It will incorporate new and historical aerial photography of fuel loads, historic burns,

vegetation recovery, and vegetation type (noting potential vulnerability of type conversion or invasion of nonnative vegetation).”

Recommendations will be implemented under the INRMP and the associated Environmental Assessment, and in accordance with the National Environmental Policy Act (NEPA). The INRMP prescribes natural resource conservation/management on the CMAGR that is: 1) sustainable; 2) in accordance with laws and regulations; and 3) integrated with existing military installation plans and mission requirements. The INRMP will ensure that lands remain available and in good condition to support the CMAGR’s military mission with “no net loss” of military training capability. This IWFMP is consistent with the direction of the INRMP.

In addition, this plan is being conducted in accordance with the National Environmental Policy Act of 1969, the Sikes Act Improvement Act as Amended through 2003 and the National Defense Authorization Act of Fiscal Year 2014. Also applicable is MCAS Yuma, Range and Training Areas Standard Operating Procedures (Station Order 3710.6J Chapter 2 Environmental Procedures).

The ultimate drivers for this Wildfire Management Plan are:

- The Sikes Act – legally mandates no net loss in the capability of military installation lands to support its mission;
- Executive Order 13112 – which directs federal agencies to prevent the introduction of invasive species; and
- The Endangered Species Act – directs federal agencies to conserve endangered and threatened species.

Wildfires can remove land from training both during a fire and afterwards, due to allowances for habitat recovery. Wildfires also cause disturbances that allow invasive species to become established, threaten plant communities, and damage habitat causing wildlife to be negatively affected. The effects of wildfires demand a comprehensive plan to be used to minimize the impacts from a wildfire, and ensure CMAGR operates within legal requirements.

1.2 Compliance with Department of Defense Policy

This Fire Management Plan is in compliance with:

- DoD Instruction (DoDI) 6055.06, *DoD Fire and Emergency Service Program*, 21 December 2006,
- Marine Corps Order (MCO) 11000.11A Marine Corps Fire Protection and Emergency Services Program (August 2017),
- Marine Corps Order 5090.2, Environmental Compliance and Protection Program,
- CMAGR Integrated Natural Resources Management Plan (INRMP), February 2017,
- Federal Wildland Fire Management Policy and Program Review, 2009,
- Sikes Act, as amended.

2.0 AFFECTED AREA

The CMAGR consists of 457,760 acres located in north-central Imperial County and south-central Riverside County, California (Figure 1). The range is bounded on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde mountains. The range is used for a variety of military training activities (e.g. live fire, artillery, inert, laser, troop movements, etc.). CMAGR is withdrawn from public use and reserved for military training.

2.1 Location

The CMAGR lies on a northwest-southeast axis and falls across two counties (Figure 2): Riverside County and Imperial County. The range is bordered on the west by the small community of Niland, California and the Salton Sea Basin. To the east, the range abuts the Chuckwalla Mountains and Smoke Tree Valley. The northern border is separated from the Orocopia Mountains by Salt Creek and includes part of the Chuckwalla Bench. The range extends south almost to Highway 78 near Glamis, California.

The range has limited access as a result of its relatively remote location in a desert region. Roads in the range include the Bradshaw Trail, which is located along the northernmost boundary of the CMAGR, the rural road network associated with Camp Billy Machen and Slab City, California southwest of the range. The Gas Line and Niland-Blythe roads on the western portion of the range are support the operation and maintenance of the gas line and overhead electric transmission lines that cross the range.

2.2 Topography

The CMAGR is located in the Sonoran Desert, encompassing much of the Chocolate Mountain Range. Its terrain is characterized by alternating rocky uplands with slopes up to 90 percent, and low valleys with broad alluvial plains, washes, and dry lakebeds. Ancient lava fields are significant features of some training areas. The range lies between -54 and 3,220 feet above mean sea level.

The CMAGR is in the Sonoran Desert and Salton Sea geomorphic provinces of California, which are situated in the southwestern portion of the Basin and Range physiographic province. This area is characterized by generally steep, subparallel, discontinuous mountain ranges that trend northwest to southeast separated by broad, gently sloping to nearly flat, deep alluvial basins. The CMAGR is characterized by the rugged Chocolate Mountains, a range that rises abruptly from broad alluvium-filled desert basins. Other landforms are typically rounded hills and plains that form a rolling topography.

2.3 Geology/Soils

Late Pliocene, Pleistocene, and Holocene alluvial deposits overlie most of the older formations in the Chocolate Mountains and form dissected piedmont slopes around the range (Norris and Webb, 1990). The older alluvium consists of poorly consolidated deposits of sand, silt, and breccia that overlie the Chocolate Mountains. Conglomerate and other rocks and forms dissected aprons and high-standing terraces.

The surfaces of these fans and terraces usually have a well-developed coat of desert pavement and desert varnish.

An intermediate alluvium overlies the older alluvium and consists of locally derived unconsolidated conglomerate, breccia, and sand that form dissected fans, low terraces, and abandoned channel features. The surfaces of the intermediate alluvium also have poorly developed desert pavement and varnish.

The youngest alluvium consists of sands and gravels occurring as channel fill in the present-day washes, as sheet wash deposits on the alluvial plains, and as wind-blown sands of the Sand Hills that overlie the intermediate alluvium (Dillon 1975). The unconformable relationships between the various alluvial deposits suggest that the base level of erosion has been intermittently lowered by continued subsidence and rifting beneath the Imperial Valley.

The Natural Resources Conservation Service (NRCS) has identified 20 soil series and seven soil associations (i.e., groups of soil series) within the CMAGR. These soils are described in the State Soil Geographic Database (STATSGO2) developed by the NRCS (2011). Most of the seven soil associations exhibit a slight to moderate water and wind erosion hazard.

However, the Rillito-Gunsight soil association, typically described as old alluvial fan soils found on dissected older alluvial fans, in valleys, and on pediments, is considered high to extremely high for water and wind erosion. This soil association consists of very deep soils on dissected older fans, soils on ancient fans with preserved surfaces, and young to ancient fan soil complexes. All soils on the CMAGR are well drained to excessively well drained and primarily consist of sandy and rocky loams derived from igneous and metamorphic rocks.

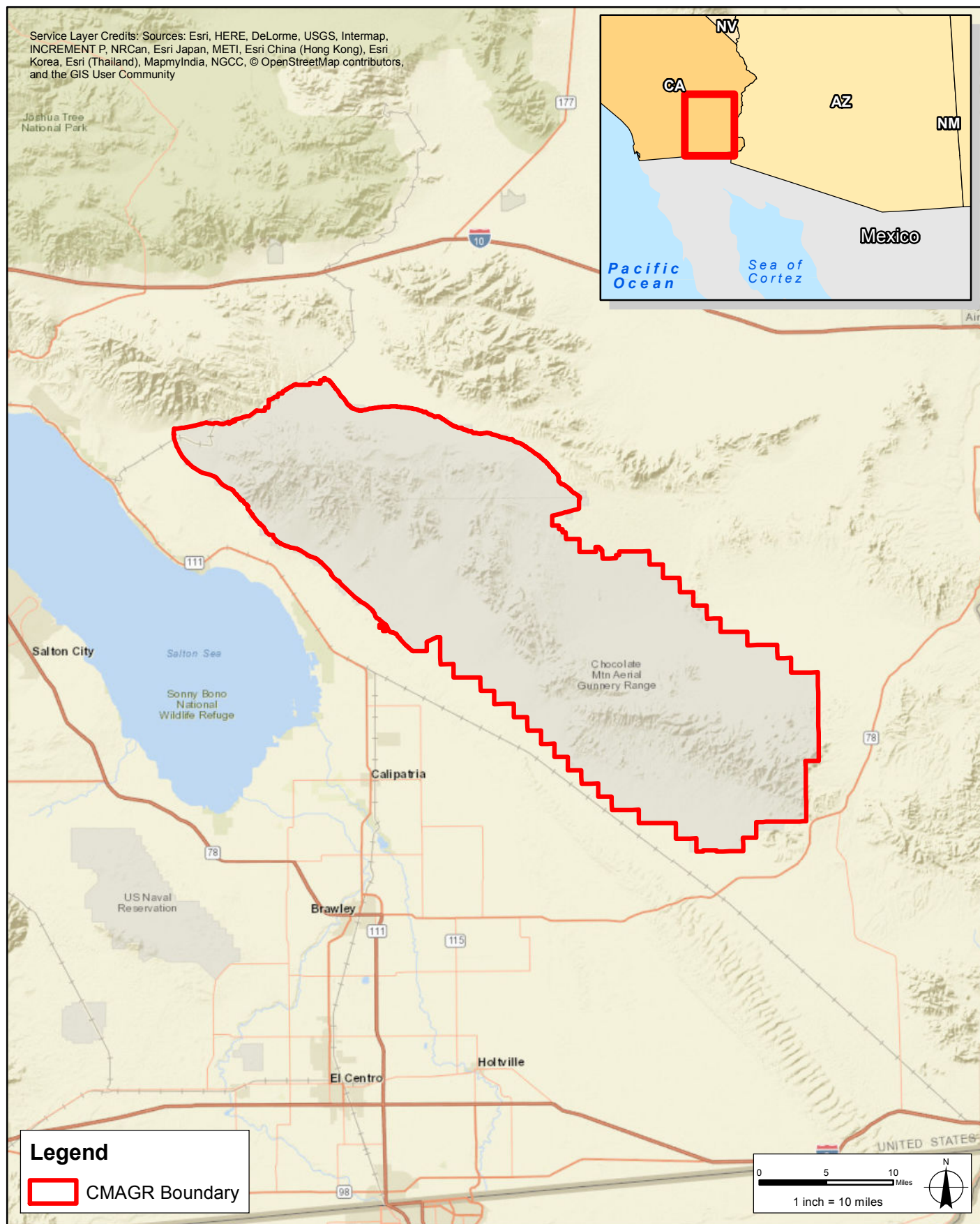
2.4 Natural Resources

2.4.1 Climate

The CMAGR is located within the Salton Sea Air Basin (SSAB), an area including all of Imperial County and the southwest third of Riverside County. The climate of the CMAGR is best characterized as desert: low humidity, high summer temperatures, and moderate winter temperatures.

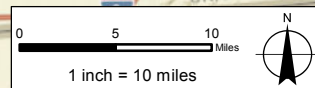
Data from the Western Regional Climate Center (WRCC) are available for Eagle Mountain, California, which is located to the west of the CMAGR near Joshua Tree National Park. Data from this location indicate that July is the hottest month (average maximum temperature of 104.9 degrees Fahrenheit (°F) (40.5 °C)). January is the coolest month (average maximum temperature of 64.4°F (18°C)) (DoN 2010) (WRCC 2011). Average precipitation measured at the Eagle Mountain meteorological station is 3.67 inches per year. The driest months are from April through June. August is the wettest month due to the influence of the summer monsoon rain pattern (DoN 2010).

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community



Legend

CMAGR Boundary



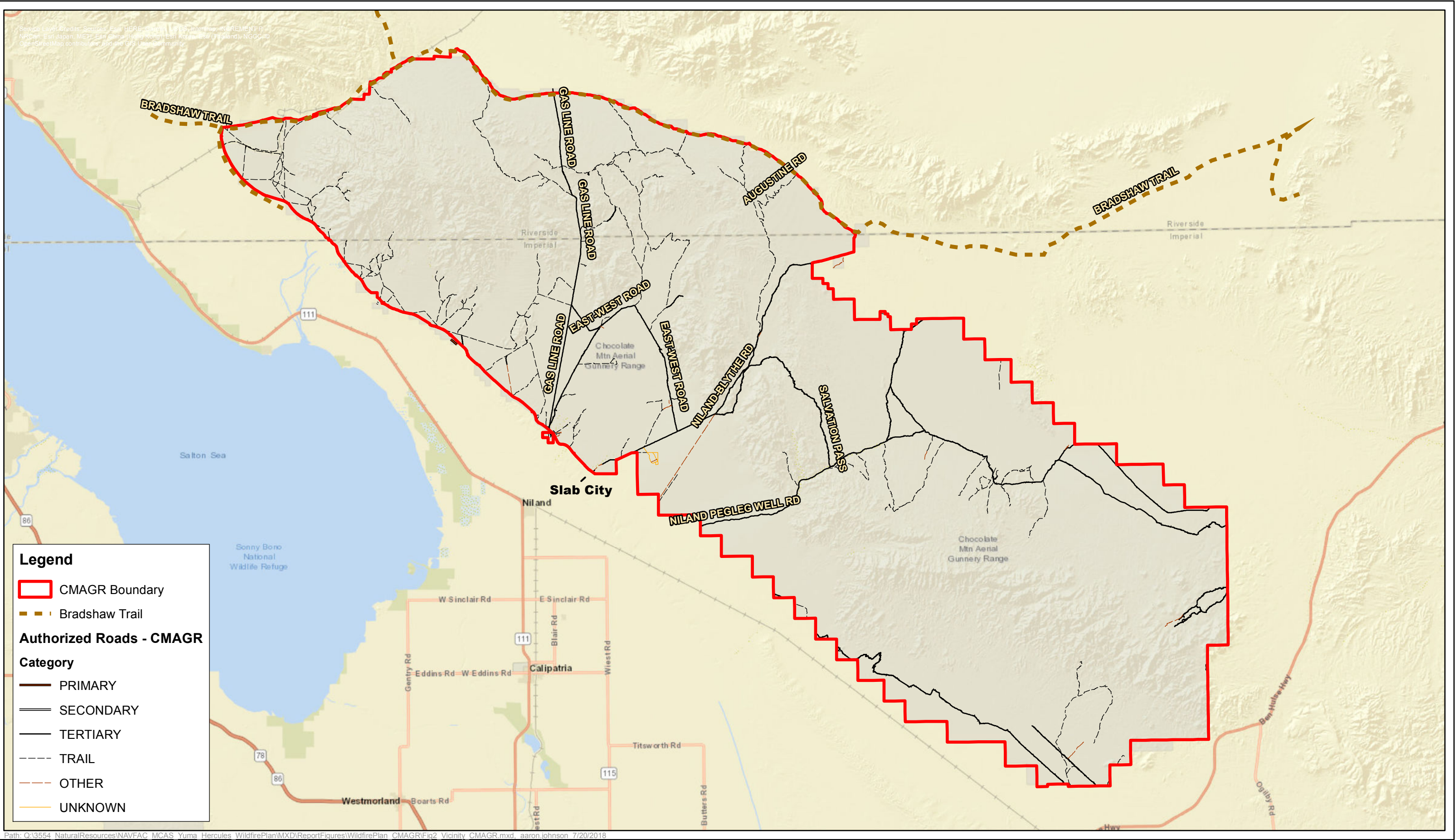
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**CMAGR Regional Map
MCAS Yuma
Yuma, Arizona**

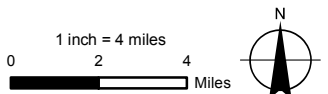
FIGURE

1

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CMAGR Vicinity Map
MCAS Yuma
Yuma, Arizona



FIGURE

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2.4.2 Water Resources

2.4.2.1 Surface Water

Water resources are defined as sources of water available for use by humans, flora, or fauna, and include surface water, groundwater, near-shore waters, and wetlands. Surface water resources include stormwater, lakes, streams, rivers, and springs. Groundwater is defined as any source of water beneath the ground surface. Surface water and groundwater may be used for potable water, agricultural irrigation, industrial, and recreational purposes.

Surface water at the CMAGR is derived from infrequent rainfall events that produce localized flash-flooding and temporary surface water runoff, especially during thunderstorms in the monsoon seasons. Rainfall averages less than 5 inches per year and the pan evaporation rate is 100 inches per year, resulting in a net water loss of up to 95 inches. The combination of low precipitation and high evaporation prevents surface water from infiltrating deeply into CMAGR soils. Thus, most of the year, the desert washes on the CMAGR are dry. During heavy rainstorms, these washes drain surface water runoff from the surrounding landscape. This runoff can be captured in natural catchments such as tinajas (natural bedrock depressions), sand tanks, charcos (mud holes), and playa lakes.

Surface water drainages are divided by the Chocolate Mountains. On the western and some of the eastern slopes, runoff drains toward the Salton Sea. Runoff from the east slope of the northern Chocolate Mountains drains to Salt Creek Wash which, in turn, drains to the Salton Sea. Runoff from the east slope of the central portion of the Chocolate Mountains drains to the Salton Sea by way of several mountain passes, the largest of which is Iris Wash. Runoff from the eastern slope of the southern portion of the Chocolate Mountains drains northeastward into Arroyo Seco and Milpitas Washes and then southeastward to the Colorado River.

Artificial tanks, wildlife water sources (guzzlers), and tinajas (surface pockets or depressions formed in bedrock that occur below waterfalls, are carved out by spring flow or seepage, or are caused by sand and gravel scouring in intermittent streams, or arroyos) are the only open water sources within the CMAGR available to wildlife. The artificial water sources largely have been constructed by Desert Wildlife Unlimited in cooperation with the California Department of Fish and Wildlife (CDFW), the Navy, and the Marine Corps and are designed to collect rainwater using concrete basins and/or natural topography to support on-range wildlife populations. The CDFW manages 27 existing guzzlers within the CMAGR that provide supplemental source of water for Nelson's desert bighorn sheep (*Ovis Canadensis nelsoni*) and mule deer (*Odocoileus hemionus*) and numerous other wildlife species in the Chocolate Mountains (BLM, 2009). In 2009, the BLM and CDFW approved the installation of eight additional guzzlers, of which four have been installed, bringing the total in use to 27 (BLM, 2009). Water in Beal Well and Salvation Well, is supplied directly from rainwater. The storage capacity of the tanks and guzzlers ranges from 1,000 to 24,000 gallons. Water can be retained in these systems for a time period of several months to more than one year, depending on weather and wildlife use.

2.4.2.2 Ground Water

Due to high evaporation rates, low rainfall, and rapid runoff, the CMAGR's groundwater resources are extremely limited. Bedrock areas of the Chocolate Mountains have limited groundwater potential and are classified by the California Department of Water Resources (CDWR, 2003) as non-water-bearing. Recharge to the groundwater basins is derived chiefly from infiltration of runoff along the base of the Chocolate Mountains. The amount and quality of groundwater stored in the groundwater basins underlying the CMAGR are not known because very few wells have been drilled on the range. Regardless, natural springs or seeps are found in some locations on the CMAGR; however, for most of the year, they are dry. Groundwater discharges from bedrock joints and fractures within the Chocolate Mountains are also ephemeral and short lived, occurring only after a rainfall event.

2.4.3 Vegetation

Vegetation in the CMAGR is largely defined by the physiography of the area, with broad desert bajadas (a broad slope of alluvial material at the foot of an escarpment or mountain) cut by washes and arroyos, coming off largely bare, Rocky Mountains, with catchments, basins and valleys below. This is also tied to the availability of water in these different environments. The area is a part of the Colorado Desert, the northwestern-most portion of the Sonoran Desert (Burk, 1988), though it is also close to the vague southern boundary of the Mojave Desert. The Sonoran Desert is warmer and wetter generally than the Mojave, with a bimodal pattern of winter and summer precipitation, although summer precipitation in the Colorado Desert is highly variable and generally far less than that in the Sonoran Desert as a whole (Burk, 1988).

The CMAGR INRMP (MCAS and NAVFAC SW, 2017) presents vegetation in four broad categories, based upon Vegetation Classification and Mapping Program (VegCAMP) classifications: Lower Bajada and Fan Mojavean-Sonoran Desert Scrub, Madrean Warm Semi-desert Wash Woodland/Scrub, North American Warm Desert Bedrock Cliff and Outcrop, and Shadscale-Saltbush Cool Semi-desert Scrub (California Energy Commission, 2014).

The bajada/alluvial fan and wash systems together comprise about 64% of the CMAGR in approximately equal proportions (INRMP), with wash systems lacing the sloping bajadas. In between washes, the Lower Bajada and Fan Mojavean-Sonoran Desert Scrub is typically a form of creosote bush scrub, a vegetation community primarily dominated by creosote bush (*Larrea tridentata*). White bursage (*Ambrosia dumosa*) may often be the dominant species as well, but much more commonly, creosote and white bursage are co-dominant. The spreading wand-like canes of ocotillo (*Fouquieria splendens*) are also a notable in these open communities of widely spaced shrubs. Community composition can be relatively simple (i.e., with only creosote present) or in varying degrees of complexity (e.g., creosote co-dominant with white bursage, or creosote dominant in a high diversity mixed shrub community). High diversity communities, may transition into a yucca woodland at higher parts of the fan, and include stem succulents like cacti (chollas, prickly pears, barrel cactus, etc.). These communities may share some species overlap with the intimately associated washes.

The great number of washes dissecting the broad bajadas can present the illusion of a near continuous stand of riparian species (Shreve and Wiggins, 1964), particularly in lower gradient areas where sheet

flow can occur across a broad area. Physically, wash systems in the CMAGR can range from a simple, shallow single channel (a stringer wash) supporting a notably higher density of shrubs along its course, to broad, well-developed relatively diverse arroyos with several to many braided channels. Madrean Warm Semi-desert Wash Woodland/Scrub includes alliances of Mojavean semi-desert wash scrubs (e.g., alliances such as *Ambrosia salsola* [cheesebush] or *Bebbia juncea* [sweetbush]), or more typical of the CMAGR, Sonoran-Coloradan semi desert wash woodland/scrub alliances. Woodlands of the latter group are very common on the CMAGR, and include trees like ironwood (*Olneya tesota*), smoketree (*Psoralea argophylla*), desert willow (*Chilopsis linearis*) and blue palo verde (*Parkinsonia florida*), often accompanied by shrubs such as sweetbush, cheesebush, cat claw acacia (*Acacia greggii*), broomsage (*Lepidospartum squamatum*), desert lavender (*Hyptis emoryi*), and Mexican bladdersage (*Salazaria mexicana*). In sandier locations, the presence of native grasses such as big galleta (*Pleuraphis rigida*) may be common, if not dominant, wash vegetation, as well.

North American Warm Desert Bedrock Cliff and Outcrop communities in the CMAGR represent the sparsely vegetated rocky slopes of mountains and ridges, generally with 5 percent or less vegetative cover. These communities account for about 36 percent of the range area. Extensive rock exposures with limited soil development provide little opportunity for vegetation to become established, with the often widely spaced or patchy shrubs being usually representative of the more populated bajadas below (i.e., creosote bush), though somewhat reduced in density and stature or vigor. Other species such as white bursage, desert holly (*Atriplex hymenelytra*) or brittlebrush (*Encelia farinosa*) may be dominant, and more xeric species, such as cacti, yuccas, agaves, and warm season grasses may be more common especially on southern exposures.

In wet years, the bajada, wash and mountain communities can host a carpet of forbs and grasses, which will typically dry off and die back fairly quickly. Non-native annual grasses and non-native forbs can also take advantage of these wet pulses, but in portions of the CMAGR seen in the preparation of this report, the CMAGR does not seem to support great infestations of invasive non-natives. In some places, the relatively unobtrusive, low-growing annual grass schismus (*Schismus* spp.) can form more or less continuous patches, but other invasive grasses such as the bromes (*Bromus* spp.) do not seem to be common. A few individuals of the highly invasive Sahara mustard (*Brassica tournefortii*) were observed; this species in particular may be more of a problem in the future.

Shadscale-Saltbush Cool Semi-desert Scrub, a desert saltbush community, is associated with valley bottoms, basins or depressions, such as playas, dunes or washes, where water may be more available due to ponding or a higher water table. These communities are not common on the CMAGR, with an estimated extent of less than 0.5 percent, and are probably represented in the CMAGR mostly by four-wing saltbush (*Atriplex canescens*). This is likely to be encountered along higher-alkalinity washes and at least ephemerally ponded alkali features. Saltbush communities have higher densities of individuals than creosote bush scrub, and are generally quite distinct from creosote communities. Salt or alkaline tolerant species are the dominants. Shadscale (*A. confertifolia*) is more common in the Mojave and Great Basin deserts where it forms extensive, often mixed saltbush communities; however, it is unlikely to be common in the CMAGR. Cattle saltbush (*A. polycarpa*) could form similar kinds of stands on alkali bajadas or flats in the Colorado Desert.

2.5 Site-wide and Adjacent Values at Risk

Because of the remote nature of the CMAGR, there exists few values at risk within and adjacent to the range. Below is a list of the most significant values identified:

2.5.1 Camp Billy Machen

The most developed value at risk is Camp Billy Machen, a training camp operated by Naval Special Warfare Command located in the Special Warfare Training Area near the southwestern boundary of the CMAGR. The camp provides living quarters, fuel storage (of 87 octane and diesel fuel), munition storage, offices, and a training facility. Camp Billy Machen personnel would respond to fires other than wildland fires. In the unprecedented event of a wildfire that would require response, firefighting staff from the Imperial County Fire Department (ICFD) would be called upon.

Portable living quarters, SWA Huts Building #6001 and #6009, both fixed facilities, each have working smoking detectors, per E7.1.3 (2006 Edition) of DoDI 6055.06 Fire and Emergency Services Program. In addition, Buildings #6001 and #6009 have emergency fire sprinkler systems. Four fire hydrants within the fenced compound are supplied from storage tanks using a fire pump system. If necessary, this fixed system supports the fire sprinkler systems in Building #6001 and #6009 as well. The entire building complex is surrounded by at least 100 feet of a combination of pavement and bare ground, which would deter surface fire spread to the structures.

2.5.2 Other Developed Sites/Structures

Because of the nature of the range, few developed sites exist. However, there is a metal recycling center north of Camp Billy Machen. The recycling center is surrounded by an area free of vegetation. Another temporary development site is a bivouac unit located at Camp Burt.

There are no internal fences within the CMAGR. A natural gas pipeline and two electric power transmission lines traverse CMAGR. The transmission lines are located within Training Area 2507 North: one runs parallel to the gas pipeline along Gas-Line Road and the other runs along Niland/Blythe Road. Repeaters are currently located in the mountains themselves; more may be positioned at Spring Hill.

2.5.3 Road Access

The CMAGR is accessed from all sides, through a variety of roads; five roads span boundaries of the range, while a few have internal loops. A network of roads provides access within the range to support infrastructure construction and maintenance, to conduct range operational clearances, training, and to manage natural and cultural resources. Though there are many access points into the CMAGR, we have identified two direct access points to review here: the Bradshaw Trail and the rural road network associated with Camp Billy Machen and Slab City. The Bradshaw Trail is located along the northernmost boundary of the CMAGR and is managed by the BLM. The Coachella Canal Road leads to the Niland-Pegleg Road, which does enter the CMAGR. Approximately 95 percent of the range is classified as roadless (USMCAS 2017).

2.5.4 Off-site Values

Bounded on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde mountains, the range is surrounded by mostly undeveloped desert. The northern border is separated from the Orocopia Mountains by Salt Creek and includes part of the Chuckwalla Bench. The range extends south to Highway 78 near Glamis, California (a small unincorporated community over 3 miles from the southern border). The highway roughly parallels the western border on its southern half.

The only developed value at risk is Slab City which is adjacent CMAGR's south-western border in Imperial County. Slab City consists of several thousand temporary and a few hundred permanent residences in a community that lacks electrical, water, and sewage infrastructure. Residents of this community rely on generators or solar panels for electricity.

The closest permanent community to the CMAGR is Niland, which is located just over 3 miles from south-western border. Niland is not considered a value at risk because of its distance from the range.

Land adjacent to the northern section of the CMAGR is within the planning boundaries of the BLM's Palm Springs-South Coast Field Office and Riverside County. The vast majority of the land in this area is administered by the BLM as an Area of Critical Environmental Concern (ACEC). This land is generally undeveloped and used primarily as open space for conservation with some recreational uses such as hiking, camping, bird watching, hunting, and rock hounding.

The BLM El Centro Field Office manages the area east of CMAGR south of the county divide. The existing land use in this area is heavily associated with renewable natural resources and utility infrastructure. Lands are both publicly and privately owned. Structures are scattered in this area, many may be abandoned or seldom used.

The United States Bureau of Reclamation (USBR) maintains a series of scattered dikes along the western boundary of the range. The dikes protect the Coachella Canal and the inactive Eagle Mountain Railroad from surface runoff. Combined, these nonmilitary surface features encompass approximately 100 acres.

The land use pattern associated with the area south of the CMAGR is generally industrial, with some recreational uses. The Mesquite Gold Mine, an open-pit mine with leaching pads for processing, abuts the CMAGR. It is considered one of the largest active gold mines in the country. The approximately 4,245 acres Mesquite Regional Landfill is adjacent to the mine site. A 5-mile-long rail spur connects the landfill to the Union Pacific Railroad (UPRR) main line, near the destinations of Glamis, Algodones Dunes, and the Imperial Sand Dunes Recreational Area (ISDRA).

The existing land use patterns southwest of the CMAGR are diverse and include several regionally significant destinations and culturally relevant attractions. The UPRR and the Coachella Canal act as physical barriers for land use transition. Land use along the CMAGR Region of Influence is primarily uninhabited and transitions from generally recreational in nature to agricultural near the UPRR-Coachella Canal junction.

3.0 GOALS AND OBJECTIVES

The CMAGR's INRMP states that the overall goal of the CMAGR training range is to provide "...quality training that provides a realistic approximation of the conditions that Marines, Sailors, Airmen, and Soldiers will face in combat as individuals and in small or large units..."

This IWFMP seeks to balance several goals: maximizing land use for CMAGR's primary mission stated above, compliance with applicable laws and regulations, maximizing personnel safety, and maintaining native habitats.

Pertinent goals and objectives specific to the prevention and suppression of wildfires include:

Goal 1 Protect human life and property within and adjacent to CMAGR through the implementation of a comprehensive wildfire management program.

Objective 1. Minimize natural resource damage from wildfires with a minimum cost consistent with values at risk, and minimize the impacts from suppression activities.

Objective 2. Assess all wildfires with regards to unexploded ordnance risks to responding personnel, and risks to natural and cultural resources.

Goal 2 Monitor hazardous fuel accumulations in areas that could be susceptible to wildfire damage in order to determine if the suppression strategy needs to be changed in the future IWFMP.

Objective 1. Monitor and evaluate the effects of fire management on the ecosystem in order to refine program objectives.

Objective 2. Facilitate scientific investigation and research to refine vegetative fuel characteristics (volume, continuity, moisture) in order to better assess risk, determine natural fire regimes, and assist in implementing the fire management program's goal.

4.0 ORGANIZATIONAL STRUCTURE

The CMAGR falls under the jurisdiction and control of the Commanding Officer (CO) of the MCAS Yuma, Arizona, who reports to the Commanding General of Marine Corps Installations West (MCIW) at Marine Corps Base Camp Pendleton, California, for administrative and facilities support. The CO administers the Installation while other departments provide support to users, including tenants and other transient personnel and activities. Because there is little to no staff permanently stationed on the CMAGR, firefighting personnel would be provided by the ICFD per a Mutual Aid Agreement (Imperial County Fire Department and Marine Corps Air Station Yuma 2016.).

4.1 Staffing

The following formal positions have direct responsibility for the implementation of the wildfire management program at CMAGR.

Commanding Officer, MCAS Yuma: Authority for the approval of this plan and responsible for the implementation of this plan. He/she will define the roles and responsibilities for personnel who implement wildland fire management on the installation, and program resources needed to implement the plan.

Range Management Department: Advises the CO, MCAS Yuma with regard to natural resource management, range safety, range operations, as well as the overall military mission of the CMAGR.

Conservation Manager: With the assistance of the Natural Resources Specialist, the Conservation Manager is responsible for assuring that a risk assessment for natural and cultural resources is performed before actions are taken.

Natural Resource Specialist: Will serve as Resource Advisor on all wildfires. Additionally, the Natural Resource Specialist will oversee the monitoring of fire effects of wildfires. He/she will develop rehabilitation and restoration plans following a wildland fire.

All wildfires on the CMAGR must be reported to Range Control (Leg Iron) (range radio or telephone). If a fire is reported to Range Control, Range Control will notify the MCAS Yuma Dispatch Center immediately. In the event of a wildland fire, firefighting will be coordinated with the ICFD in conjunction with the MCAS Yuma Fire Department who are ultimately responsible for all suppression activities in the CMAGR. Fires may be reported by calling 911 as well, however, this option may result in a longer response time than calling range control directly. The ICFD will also notify MCAS Yuma Dispatch Center of any responses on the range. The ICFD will utilize needed resources based on the 2016 Mutual Aid Agreements with surrounding agencies. The decision to use military personnel will be determined by the CO. The CO will also decide upon the use of military aircraft for suppression activities as necessary to prevent the spread of fire onto or off the installation. The CO of MCAS Yuma will cooperate with neighboring landowners during wildfire suppression.

5.0 WILDLAND FIRE PROGRAM COMPONENTS

All fires that burn natural vegetation in the CMAGR are defined as wildland fires. However, these fires do not receive immediate fire suppression actions to minimize the area burned because the vegetative fuels generally do not sustain fire spread. Wildfires are too infrequent and limited in extent to pose a significant threat to the sensitive ecosystems, cultural sites, and testing/training lands of CMAGR. The vast majority of CMAGR is unburnable except under extreme vegetation growth conditions. Even during unusual periods of excessive rainfall, such as the rainfall which occurred in 2005, very large and destructive wildfires were not possible due to the low vegetative fuel volume and discontinuous arrangement of fuels. As such, wildfires are not considered to be a hindrance to operations.

Modified suppression is an appropriate strategy when also considering the safety of firefighters in light of the unexploded ordnances. Even without action, the specific suppression objectives for individual fires is met because of the condition of the fuels (discontinuous and of low volume).

In addition to fire response, a crucial wildland fire management strategy will be to emphasize pre-fire actions such as ignition prevention and attentive monitoring of fuel conditions that may warrant suppression.

5.1 Wildland Fire Suppression

5.1.1 Initial Attack

All wildfires on the CMAGR must be reported to Range Control (Leg Iron) (range radio or telephone). If a fire is reported to Range Control, Range Control will notify the ICFD immediately. All fires and medical calls are handled through 911 as the immediate-responding fire crew may not be present due to training or other calls. Reference DoDI 6055.06 and the Wildland/WUI Operations Fire and Emergency Services SOP (2016) for current wildfire response protocols at the CMAGR.

Per the 2016 Mutual Aid agreement, response to wildland fires will be by the ICFD. ICFD Station 7 will be the first engine to respond. The station houses a Type 1 Engine and is staffed 24/7 with one Captain, a driver/operator and a Reserve Firefighter. As per wildland training, ICFD annually updates their Red Card certifications based on the requirements outlined by the NWCG and California OES. The ICFD integrates wildland training as part of their continued trainings. The engine assigned to Station 7 is a 2-wheel drive apparatus (1000 gal water capacity) and does have some access limitation. All wildfires will be reported to the CMAGR Natural Resources Specialist so that he/she can serve as Resource Advisor to the Incident Commander (IC). The IC will ensure no firefighter will be placed in the vicinity of unexploded ordnance. Ground-based initial attack will be delayed until the site has been confirmed clear of explosives.

After a wildland fire incident, it is suggested that the ICFD report the incident to NFIRS. For all other incidents, ICFD will complete a report and make those available within ten (10) days from the date of the incident.

Fire losses caused by wildland fires shall be investigated by MCAS Yuma to determine point of origin and fire cause before initiating other safety or legal investigations (DoDI 6055.06, 6.14.2). In addition, point of origin and fire cause shall be provided for subsequent safety and legal investigation (DoDI 6055.06, 6.14.3). Lastly, an independent fire investigation and report for fire losses meeting the Class A accident threshold defined by DoDI 6055.07 Reference (p) will be completed.

5.1.2 Extended Suppression

Because of the patchy arrangement and low fuel volumes, wildfires will not require suppression assistance; extended suppression is not required, nor addressed, in this IWFMP.

5.1.3 Minimum Impact Suppression Tactics (MIST) Requirements

The most minimum impact suppression tactic will be followed. No suppression is expected because the fires are self-extinguishing.

5.1.4 Other Fire Suppression Considerations

In addition to concerns regarding protection of special status species, fire suppression can affect several other types of values at risk, such as cultural resources, and the protected habitats themselves. The presence of special hazards, and major utilities and easements should be taken into account when suppression action is considered.

Because wildfires are expected to be typically rare and non-damaging, natural and cultural resources would not be affected by the limited fire suppression activities and the associated negative impacts that result.

All ground-based wildland fire suppression activities will be delayed until the site has been confirmed clear of explosives. Air-based wildland fire suppression would be necessary until ground-based travel can be deemed safe. It is most likely fires would be self-extinguished by that time.

5.2 Wildland Fire Preparedness

Camp Billy Machen personnel do not respond to wildland fires. In the unprecedented event of a wildfire that would require response, firefighting staff from the ICFD would be called upon.

5.2.1 Fire Prevention, Community Education, Other Community Assistance Activities

Because of the paucity of damaging wildfires, there are no ignition prevention requirements established by this IWFMP. Per Enclosure 3.8 of DoDI 6055.06 Fire and Emergency Services Program, the minimum fire prevention staffing is based on thousands of square feet, with the minimum for any fire staff is 250,000 - 1,000,000 sq. ft. The facility at Camp Billy Machen is smaller than the minimum and no fire prevention staff is required in CMAGR. Regardless, the MCAS Yuma Fire Department performs quarterly fire safety and fire protection system inspections of all facilities/buildings at Camp Billy Machen. Any hot work processes that occur within that compound must be permitted by the MCAS Yuma Fire Department. Additionally, designated permanent

personnel assigned to Camp Billy Machen are trained to perform monthly fire safety inspections of all facilities/buildings at the camp.

There is no Fire Danger Rating System (FDRS) specific to the CMAGR to manage wildfire ignitions. There are no weather stations in the CMAGR that could inform decisions regarding Special Orders and Closures.

As part of its 5-year action plan, Action Step 4.16-4 of the INRMP sets forth a requirement to install and maintain weather stations, including rain gauges at specific study locations, starting 2019. These weather stations will allow decisions regarding fire prevention (i.e. Special Orders and Closure) to be made, if warranted, based on on-site conditions.

E3.8 of DoDI 6055.06 notes that Public Fire Education Programs shall be developed, however, public access and all recreational activities are precluded by safety and security requirements related to the aerial gunnery mission and potential for unexploded ordnance at the range. This restricted access reduces fire prevention challenges due to lack of human-caused ignitions.

Action Step 4.21-1 of the INRMP requires that the CMAGR establish and maintain adequate control measures (signs, gates, fences, etc.) to provide for security, safety, and protection of natural resources. This Action Step was aimed at law enforcement, but will aid fire prevention as well.

Even though wildfires do not spread in the vegetation at this time, several practices that limit ignitions are being followed:

- Targets are made of non-combustible material; this practice should continue
- Vehicles may not venture off road
- No camping is allowed
- Structures in Camp Billy Machen are made of ignition-resistant construction; the main buildings (#6001 and #6009) are equipped with fixed fire suppression systems.

Significant fire spread potential is low at the CMAGR, a direct result of natural fuel gaps and discontinuity. As a result, CMAGR does not have nor does any military personnel maintain any constructed firebreaks, fuel breaks, or fuels management areas throughout its landholdings, nor is there an intent to create any. During the course of military training and operations within the CMAGR, however, military personnel do groom some areas to meet various mission requirements which may reduce fuels on specific impact areas.

5.3 Annual Fire Training Activities

Because the staff at the MCAS are not expected to respond to wildfires on the range, this IWFMP does not require annual training activities. However, the MCAS trains maintenance personnel to the Fire Warden level to perform monthly general fire safety and fire protection system inspections. It is recommended the MCAS Explosive Ordnance Division hold annual joint training with the ICFD regarding unexploded ordnance.

5.4 Wildland Fire Season Readiness (testing, inspection and annual review)

The Fire Department at the MCAS in Yuma does not have a wildland firefighting mission. They will depend heavily on local, mutual aid agreements with the ICFD for any wildland fire suppression activity. Because the MCAS Yuma does not have staff for wildland firefighting, no testing or inspection is necessary.

An annual inspection of fuel conditions is the only pre-season activity that could be performed by MCAS staff. If rainfall is exceptionally plentiful, an assessment to determine volume and continuity of fuels would be warranted so that the Range Management Department will contact the ICFD in preparation for the exceptional event.

5.5 Pre-Incident Plan

Because a wildfire of consequence is not anticipated, this IWFMP does not require preparation of a Pre-Incident Plan.

6.0 CERTIFICATION, TRAINING, AND FITNESS STANDARDS FOR WILDLAND FIRE MANAGEMENT PERSONNEL

6.1 Certification Standards

All civilian, contractor and emergency services personnel involved in wildland fire management must possess certifications appropriate for their expected level of involvement in the wildland fire organization. Personnel in the ICFD are all “red card” certified per NWCG standards. In addition, the ICFD integrates wildland fire into their ongoing training.

DoD personnel in the fire protection and prevention job series, GS-0081, and Fire & Emergency Services contractors will meet the certification standards specified in NFPA 1051 - Standard for Wildland Fire Fighter Professional Qualifications and NFPA 1002 - Standard for Fire Apparatus Driver/Operator Professional Qualifications. Personnel who have learned skills from outside wildfire suppression, such as agency specific training programs or training and work in prescribed fire, structural fire, law enforcement, search and rescue, may not be required to complete specific courses to qualify in a wildland fire position. However, position task books must be completed for documentation of certification. Personnel in the natural resources job series (GS-0401 thru GS-0499), cultural resources (GS-0193), and natural/cultural resources contractors with jobs requiring wildland fire responsibilities, must meet either the NFPA 1051 and NFPA 1002 certifications or the equivalent certifications in NWCG Wildland Fire Qualification System Guide (Publication Management System 310-I/National Fire Equipment Catalogue 1414).

DoD personnel mobilized to participate in wildland fire management activities on federal properties not under DoD jurisdiction, either through mutual aid agreement or other means, must be certified for the expected level of involvement under NWCG standards. GS-0081 job series and DoD contractor personnel that seek wildland fire certifications must comply with the appropriate NWCG criteria.

Position descriptions for new employees who will participate in wildland fire activities will reflect the expected level of involvement and required certifications. Position descriptions for natural/cultural resources personnel with wildland fire management duties must state if the position qualifies the position holder as a primary or secondary wildland firefighter, as described in Chapter 46 of the Office of Personnel Management Civil Service Retirement System and Federal Employees Retirement Services Handbook for Personnel and Payroll Offices. Natural resources personnel not classified as a primary or secondary wildland firefighter may perform collateral duty in wildland fire management activities as qualified.

DoD personnel holding positions as primary and secondary wildland firefighters will be certified, as a minimum requirement, in Cardio-Pulmonary Resuscitation (CPR) and Standard First Aid, by the American Red Cross or comparable certification authority.

The Headquarters Air Force Civil Engineering Support Agency/Civil Engineering Fire Protection is the executive agent for the DoD Fire Fighter Certification Program (FFCP) and will be responsible for issuing, maintaining, and tracking of NFPA wildland firefighter certifications. The installation Wildland Fire Program Manager is responsible for issuing, signing and tracking of NWCG Qualification Card/Incident Command System (also known as "red cards") for installation personnel.

7.0 INTERAGENCY COOPERATION AND MUTUAL AID AGREEMENTS

Cooperative agreements are best made prior to a need for cooperation. Per E2.5I of DoDI 6055.06, the DoD Components, under Chapter 15A, of 42 U.S.C. are encouraged to enter into reciprocal agreements with local fire protection agencies for mutual fire response. In addition, municipalities can be compensated for direct costs and losses sustained while fighting fire on Federal property, should the need arise (DoDI 6055.06 E5.1.4.3). These agreements include cross-boundary agreements whereby the different agencies could enter property that would otherwise be closed. Agreements can address cost apportionment, whereby, for example, the local fire department can be compensated for providing fire suppression services for the time they spent on the CMAGR. Another tool for mutual benefit are Memorandum of Agreement and Emergency Response Contracts which are broadly written and offer a framework for more specific agreements.

Installations are encouraged to develop regional partnerships for wildland fire management support, by means of reciprocal agreements with other federal, state, local and private entities, to share human, logistical, and operational resources. Emergency assistance and mutual aid agreements will conform to the guidelines stated in DODI 6055.06 - DoD Fire and Emergency Services Program (December 21, 2006), and MCO 11000.11A Marine Corps Fire Protection and Emergency Services Program (August 16, 2017).

There are several local, state and federal fire management agencies that could assist in response, monitoring, and rehabilitation should a wildfire ever spread on the CMAGR. These include the ICFD, CAL FIRE, National Park Service (NPS), BLM, and US Fish and Wildlife Service (USFWS).

This is especially appropriate for CMAGR as the MCAS Yuma Fire Department is several hours from the site. The closest fire department is the ICFD Station 7. However, these personnel are not qualified to respond in areas of unexploded ordnance. CAL FIRE does not have a station in Imperial County, however, it provides fire protection for all private lands in Riverside County (in conjunction with partner cities). MCAS Yuma currently has a Mutual Aid Agreement (MAA) with the ICFD to respond to medical and fire calls at Camp Billy Machen and within the CMAGR in general.

Other federal agencies with wildland fire management capabilities are more nearby. Nearby federal lands include, Joshua Tree National Park (located just north of Interstate 10), USFWS National Wildlife Refuges (located northwest of Niland) and BLM (located north of the CMAGR). These federal agencies can offer assistance and can engage in cooperative agreements if presented with the opportunity.

Following proper coordination with the Office of the Secretary of Defense through NORTHCOM and Joint Directorate of Military Support (JDOMS), military assistance (both military and civilian personnel) may be furnished to the National Interagency Fire Center (NIFC) in national fire emergencies, pursuant to the Interagency Agreement for the Provision of Temporary Support During Wildland Firefighting Operations among the Departments of Defense, Interior, and Agriculture (2005) and subsequent modifications. Support to NIFC is reimbursable under the Economy Act. Local area assistance included in existing agreements may be authorized by the installation/garrison commander. Immediate response requests will be handled per DODD 3025.18 Defense of Civil Authorities (DSCA).

A mutual-aid agreement exists with the ICFD and is included in this document as an appendix. The mutual aid agreement establishes automatic aid by ICFD to Camp Billy Machen and authorizes reciprocal response in the event of an extraordinary emergency. The nature and extent of aid to be furnished will be decided by the Fire Chief of the requested party and is dependent on availability of personnel and equipment.

Further interagency cooperation is possible. The NPS could provide base personnel with Wildland Firefighter training. The BLM could give 'Red Card' certification to enable biological monitoring of fire site resources by office staff. The CMAGR is encouraged to take advantage of these opportunities as they arise.

7.1 Interagency Contacts

The following are the Interagency Contacts:

1. The Imperial County Fire Department, Station 1, Headquarters is located at 2514 La Brucherie Rd, Imperial, CA 92251; The Department phone number for the On-Duty Battalion Chief is (442) 265-3010 and the On-Duty Captain can be reached at (442) 265-3011.
2. ICFD Station 7, Niland is located at 8071 Luxor Ave, Niland, California 92257 and can be reached at (760) 359-0410 (business line). For emergencies, call 911. Note: all stations mailings/correspondence go to ICFD Station 1, Headquarters.
3. The BLM has assisted with fire suppression in other DoD ranges; the nearest office would be either the El Centro Field Office (760-337-4400), or the Palm Springs-South Coast Field Office 760-833-7100. NPS can be contacted at Twenty-nine Palms, at (760) 367-5500 to develop pre-fire cooperative agreements.

8.0 SMOKE MANAGEMENT AND AIR QUALITY

Given the small size of fires, their rarity, and the relatively remote location of CMAGR, smoke management is not a major priority for CMAGR resource managers. Smaller fires may affect Highway 111 (to the west) or Highway 78 (to the south), but are unlikely to affect any other sensitive resources due to the distance to them and dispersion in between. Within five miles outside of the CMAGR boundary, there are no population centers of greater than 500 people, no hospitals, no schools, no nursing homes, and no airports, all of which are primary concerns for smoke management.

Regardless, the fire management program at CMAGR must be sensitive to the objective of maintaining clean air standards. Regional haze and unhealthy air quality have become common for much of the Southern California area during summer months which are dominated by high pressure systems.

A portion of the CMAGR lies within Imperial County and a portion lies within Riverside County. The Environmental Protection Agency (EPA) considered both counties as non-attainment for Respirable Particulate Matter (PM₁₀ and PM_{2.5}), Nitrogen Oxides (NO_x), and Ozone precursors (O₃). The thresholds for the Imperial County portion of the CMAGR are 100 tons per year for O₃ precursors, including NOX and Reactive Organic Gases (ROG), 70 tons per year for PM₁₀ and 12 tons/year for PM_{2.5}. The thresholds for the Riverside County portion of the CMAGR are 25 tons per year for O₃ precursors and 70 tons per year for PM₁₀. The California Air Resources Board (CARB) is responsible for enforcing both the federal and state air pollution standards (DoN 2010).

Because of the generally poor air quality in these air basins, the range is encouraged to work closely with CARB in the event a wildfire occurs within the range that has the potential to add particulate matter into the air basins.

9.0 SAFETY AND EMERGENCY OPERATIONS

Personnel safety is paramount on CMAGR. Firefighters will not be sent onto live fire ranges to fight wildfires because there is a great probability of unexploded ordinance in the training areas. This poses a tremendous risk to firefighter safety. Protection of structures is the next priority. The buildings will be protected, to the best ability of the responding ICFD firefighting crew, with the available resources. Equipment will also be protected where possible.

9.1 Personal Protective Equipment

The IWFMP requires all personnel involved in wildland fire activities to be outfitted with protective clothing and equipment that meets NFPA 1977 - Standard on Protective Clothing and Equipment for Wildland Fire Fighting which establishes the requirements for protective clothing. Minimum gear includes: Nomex shirt, Nomex pants, helmet, leather gloves, eye protection, and work boots with Vibram© soles.

10.0 WILDLAND FIRE BEHAVIOR FACTORS

10.1 Range of Potential Fire Behavior

Within the CMAGR, land cover is predominantly unburnable, with bare ground accounting for over 75% of the range. The remainder 25% is classified as low to moderate grass and shrub with some timber with low shrub for a small portion of the range. Table 10.1 shows acres for each mapped fuel model along with its percent cover within CMAGR. Fire behavior fuel models (Scott and Burgan, 2006) are denoted by their fire carrying fuel type (i.e., grass – G, grass / shrub – GS, timber – litter, TL) and a numerical identifier (e.g. ‘GR2’).

TABLE 10.1. FUEL MODEL ACRES TABLE (AS DEFINED BY LANDFIRE v1.4)

ID	Expected Fire Behavior	Acres	Percent
NB1 – Urban (91)	Un-burnable (within model)	6.89	0.00%
NB3 – Agricultural (93)	Un-burnable (within model)	0.22	0.00%
NB8 – Open Water (98)	Un-burnable	1.78	0.00%
NB9 – Bare Ground (99)	Un-burnable	346,770.52	75.41%
GR1 – Short Grass (101)	Short, sparse dry climate grass is short, naturally or heavy grazing, predicted rate of fire spread and flame length low	3,782.72	0.82%
GR2 – Moderate Grass (102)	Low load, dry climate grass primarily grass with some small amounts of fine, dead fuel, any shrubs do not affect fire behavior	5,629.93	1.22%
GS1 – Low Grass/Shrub (121)	Low load, dry climate grass-shrub shrub about 1 foot high, grass load low, spread rate moderate and flame length low	1.55	0.00%
GS2 – Moderate Grass/Shrub (122)	Moderate load, dry climate grass-shrub, shrubs are 1-3 feet high, grass load moderate, spread rate high, and flame length is moderate	72,851.93	15.84%
SH2 – Moderate Shrub (142)	Moderate load dry climate shrub, woody shrubs and shrub litter, fuel-bed depth about 1 foot, no grass, spread rate and flame low	5,902.59	1.28%
TU1 – Low Timber/Shrub (161)	Low load dry climate timber grass shrub, low load of grass and/or shrub with litter, spread rate and flame low	24,904.68	5.42%

Alone, these fuel models represent the potential range of fire behavior one can expect given the vegetation on the ground.

10.2 Expected Fire Behavior

FlamMap (Finney, 2006) was used to determine likely fire behavior under typical fall (September - November) weather conditions. This model was constructed to determine the worst-case scenario wildland fire behavior across the entire range. This model does not determine whether a fire will spread from a single (or multiple) ignition points. Rather, this model only predicts whether any given location will burn given specific inputs (i.e. slope, elevation, aspect, fuel moisture, fuel type, etc.).

The area modeled was bounded by the following coordinates (GCS NAD83):

- North: 33.6 degrees latitude
- South: 33 degrees latitude
- West: -116 degrees longitude
- East: -114.6 degrees longitude

Six data layers were downloaded from the LANDFIRE website. The following list details the version and attribute definitions for each layer:

1. Existing Vegetation –or EVT is a data layer representing the current distribution of the terrestrial ecological systems classification developed by NatureServe for the western hemisphere. It is defined as a group of plant community types (associations) that tend to co-occur within landscapes with similar ecological processes, substrates, and/or environmental gradients. EVTs are mapped in LANDFIRE using decision tree models, field reference data, Landsat imagery, digital elevation model data, and biophysical gradient data.
2. Fuel Models – FBFM40 (LANDFIRE version 1.40). Initially, thirteen typical surface fuel arrangements or "collections of fuel properties" (Anderson, 1982) were described to serve as input for Rothermel's mathematical surface fire behavior and spread model (Rothermel, 1972). Since 2005, these initial models were refined to 40 additional models. These represent a more refined version of the basic 13 fuel models.
3. Canopy Cover – Described by percent cover of tree canopy in a stand.
4. Canopy Height – Described as the average height of the top of the canopy for a stand. Reported in meters * 10.
5. Canopy Base Height – Described by the lowest point in a stand where there is sufficient available fuel (0.25 in dia.) to propagate fire vertically through the canopy. Reported in meters * 10.
6. Canopy Base Density – Defined as the mass of available canopy fuel per unit canopy volume that would burn in a crown fire. Reported in kg/m³*100.

The following parameters were used in the fire behavior run in FlamMap:

Though specific daily weather and wind data was used to condition the fuel moistures, 20-foot wind speed was set to 12 mph. Direction was set to 270. Foliar Moisture Content was set to 100%. To condition the fuels, weather and wind files derived from weather data gathered by a RAWS weather station located south-west of the CMAGR (QCAC1 CAHUILLA). In addition, fuel moistures were set for all fuel models to the corresponding amounts shown in Table 10.2.

TABLE 10.2. FUEL MOISTURE PERCENTAGES USED

Class size	Percent
1 hr fuels	3
10hr fuels	4
100hr fuels	5
Live herbaceous	70
Live woody	70

Outputs included Rate of Spread, Flame Length, and Crown Fire Activity using the Scott/Reinhardt (2001) option under the Crown Fire Calculation Method. We used the default for the 'Options' parameter (Relative Spread Direction from Maximum).

Results are presented below.

10.2.1 Flame Length

Flame length (measured in feet) is the length of the flame at the head of the fire measured from the middle of the combustion zone to the average position of the flame tip (Andrews and Rothermel, 1981).

Flame length is important because it is a fire behavior characteristic we most often associate with a wildfire. The height (or length) of flames is what is seen first and it can determine how a fire will be suppressed. The lower the flame length, the more approachable it is by hand crews.

The model predicted no fire for 75 percent of the CMAGR (Table 10.3). Where modeled fire did occur, flame lengths were lower than eight feet and occurred on all slopes in the higher elevations where sparse vegetation exists.

TABLE 10.3. PREDICTED FLAME LENGTH ACRES

Value	Acres	Percent
No Fire	343,700	75%
Less than 4 feet	37,876	8%
4.1 - 8	74,444	16%
Greater than 8 feet	0.44	0%

Fires with flame lengths of four feet or lower can be suppressed by people on the ground using hand tools. A simple 'hand line' of 12 to 24 inches wide should hold the fire. Once over four feet, the fire is too intense for confrontation with people and a handline is not reliable. Wider 'fire lines' can be employed using heavy equipment.

Only 16% of the range may experience a fire with flame lengths between four and eight feet. The vegetation and slopes that support this potential fire behavior is scattered throughout the range in isolated clumps.

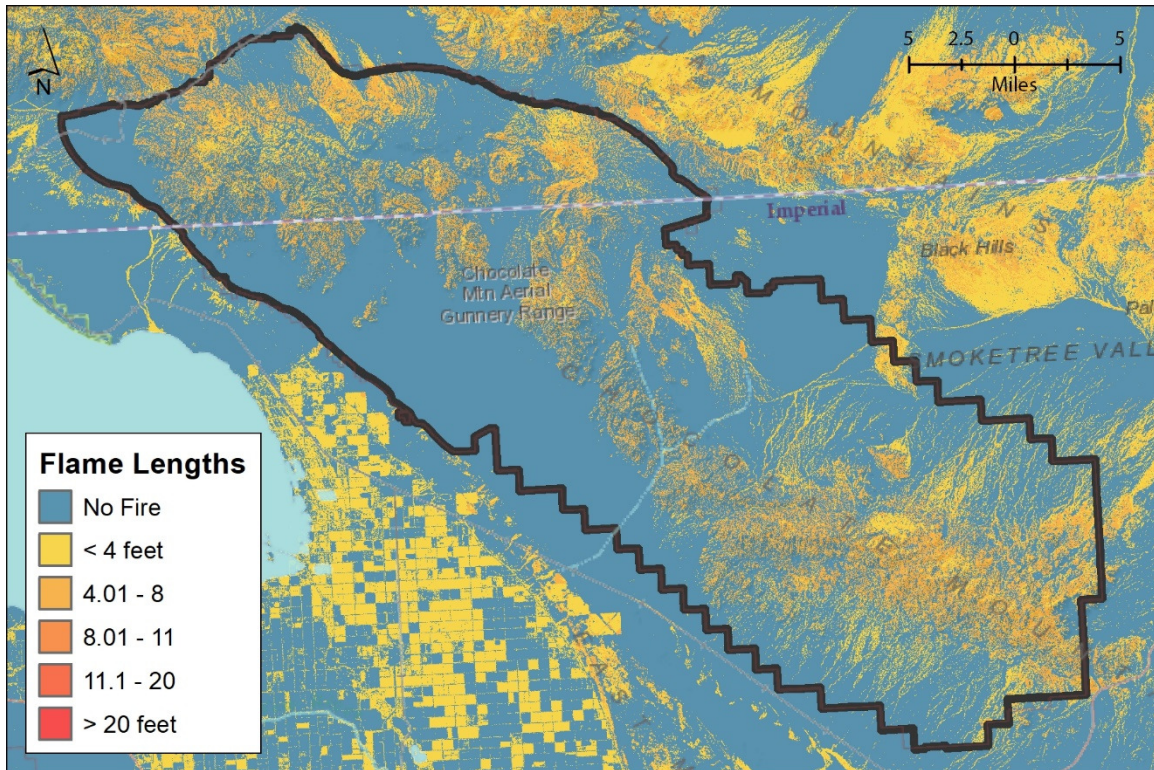


Figure 3. Map of flame length results for CMAGR

10.2.2 Rate of Spread

Rate of spread (measured in chains/hour) is the forward rate of spread at the head of a surface fire. Like the predicted flame lengths, 75% of the CMAGR experiences no fire at all (Table 10.4).

TABLE 10.4. ACRES OF RATE OF SPREAD CLASSIFICATION

Value	Acres	Percent
No Fire	343,702	75%
Less than 1.1 ch/hr	374	0%
1.1 – 5	28,315	6%
5.1 – 10	5,330	1%
10.1 - 20	8,318	2%
Greater than 20 ch/hr	69,982	15%

Fifteen percent of what is predicted to burn, experiences rate of spreads greater than 20 chains/hour (one chain equals 66 feet). This relatively fast fire spread is predominately through fuel model GS2 – a grass-shrub fuel model that typically experiences a high spread rate. While a fast rate of spread does not necessarily mean a problematic fire, coupled with high flame lengths, a fast-moving fire cannot be suppressed with a hand-crew. However, the spatial discontinuity of the burnable vegetation would indicate the fire would burn itself out quickly.

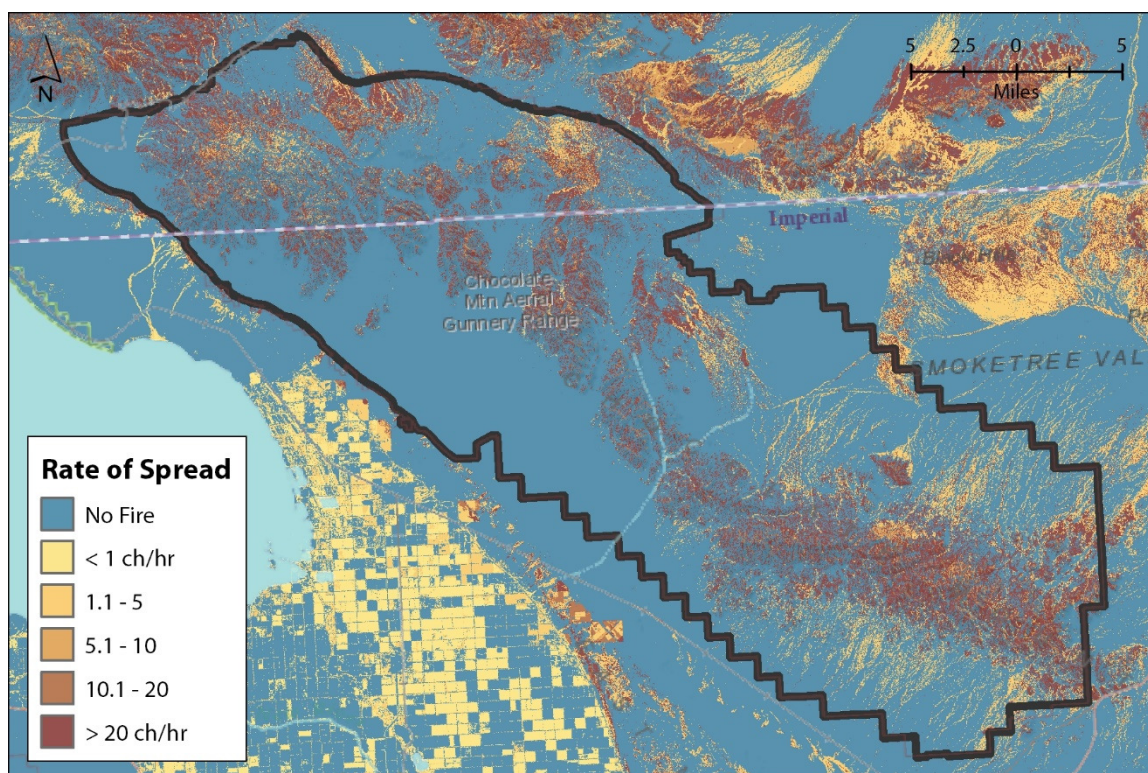


Figure 4. Predicted rate of spread for the existing conditions scenario

10.2.3 Crown Fire Activity

A surface fire that makes the transition to some form of crown fire is modeled from canopy base height, stand height, canopy bulk density, and foliar moisture content. It is important to keep in mind that crown fire activity only pertains to timber fuel model types. While shrub types may “crown”, they are not modeled in FlamMap. There is only one timber type within the CMAGR and it accounts for only 5% of the CMAGR. Regardless of dry and windy conditions, no crown activity is predicted (Table 10.5). No torching or crown fire is expected within the CMAGR.

TABLE 10.5. ACRES OF CROWN FIRE ACTIVITY RESULTS FROM FLAMMAP

Value	Acres	Percent
No Fire	343,666	75%
Surface Fire	112,356	25%
Torching Fire	0	0%

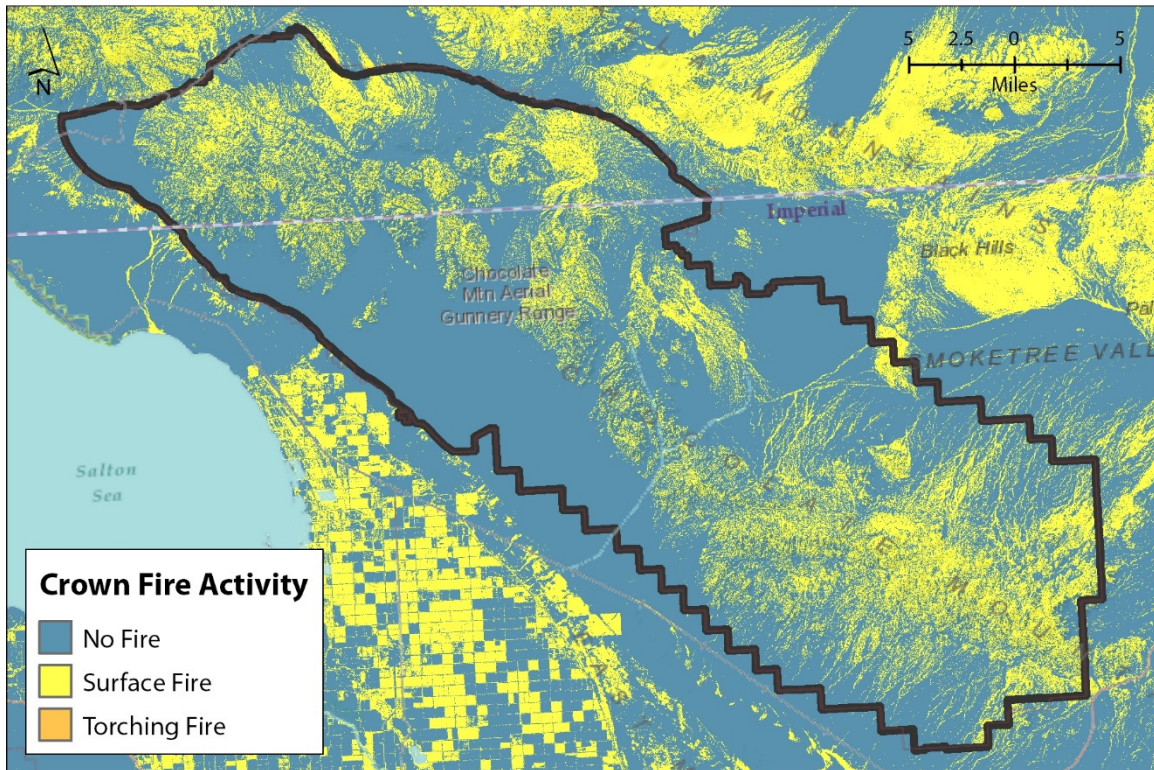


Figure 5. Predicted crown fire activity for the CMAGR

10.3 Wildland Fuels

The Sonoran Desert has a very low fuel load. The distance between individual plants suffices to hinder fire proliferation. When fires do occur, they are limited to very small areas. Traditional fuel loads in the Mojave Desert range from <50 pounds (lbs)/acre to <250 lbs/acre, depending on the habitat type. With the increase of invasive species, the fuel load has grown to ~750 to ~2500lbs/acre (Brooks et al. 2001). The historic fire regime is being altered as invasive grasses and other aggressive non-native species colonize new areas of the desert landscape. These plants increase wildfire frequency and severity by adding to the amount of fast burning fuel and creating dense areas of vegetation. As plants dry out in the summer, these prolific grasses and shrubs form areas where a fire can spread rapidly over large areas. The aggressive, non-native species establish themselves in disturbed areas quicker than the less fire-tolerant, native shrubs, creating vast areas dominated by non-native species. These areas become more prone to fire, exacerbating the problem.

10.4 Structural Fuels

The only permanent structures are at Camp Billy Machen, where the main building is constructed using ignition resistant practices, and has a sprinkler system. In addition, the facility has a non-combustible fence surrounding the facility. The only exposed combustible material observed during a site visit in September 2017 was an assemblage of wooden pallets used for special warfare training, as approved by the Fire Department at MCAS.

10.5 Wildland Fire Weather and Fire Danger

Currently there is no Fire Danger Rating System (FDRS) data specific to the CMAGR to manage wildfire ignitions. There are no weather stations in the CMAGR that could inform decisions regarding Special Orders and Closures. There are plans to install weather stations starting in 2019.

However, one RAWS station currently exists southwest of the CMAGR, located at longitude - 115.1735, latitude 32.973639, 278 feet in elevation. This is near the intersection of Highway 78 and Gecko Road, over 6 miles away from the CMAGR boundary. While not entirely representative of the entire range, the weather station does record continuous weather data. In the event of future changes that may increase wildland fire risk and potential, and for preparation purposes, data from this weather station can be used to determine expected fire danger.

Because there is no FDRS specific to the CMAGR to manage wildfire ignitions, and because fire prevention and response will not be based on NFDRS indices, this section is omitted from the INFMP.

11.0 RISK ASSESSMENT / DECISION ANALYSIS PROCESSES

While the likelihood of a wildland fire burning through the range is limited, power pole lines, pump houses, water storage facilities, and related equipment can be threatened by small wildland fires.

These assets will be prioritized by the asset holder. The Facilities Maintenance Division (FMD) should assign buffer zones to areas with a high threat to equipment and infrastructure, to include the assets listed above. The risk assessment would evaluate the vulnerability of the asset along with its value and the probability of a threatening event. Because of the low fuel volume, fire intensity is predicted to be quite low.

11.1 Wildland Fire History

There have been no wildfires in the CMAGR mapped or recorded to the NFIRS.

The Sonoran Desert, historically, has had a low incidence of wildfire. Human activities have increased fire frequencies in the desert elsewhere because of increasing invasion of exotic grass and shrub species, such as *Schismus barbatus* (Mediterranean grass), *Brassica tournefortii* (Saharan mustard), and *Salsola tragus* (Russian thistle), which increase fine-fuel loads and fuel continuity. However, these invasive species were not observed by Carol Rice, the fire ecologist, in quantity during a site visit September 2017.

11.2 Likely Scenario

Recent fire history and the predictive model presented in this document show that if a wildland fire were to start on the CMAGR, it would likely burn a limited amount of vegetation before running out of fuel. The distance between burnable vegetation clusters is far enough that wildfires would not readily spread.

Because the predicted fire behavior under hot, dry conditions is low to moderate, and because the risk to human injury and equipment from unexploded ordnances is too high, in the event of a wildland fire, there will be no direct response to suppress the fire. While military training may be impeded, it is likely training operations would be affected for hours, not days, and would be limited to the immediate area of the fire.

In the event of a structural fire, the ICFD will be notified to provide CMAGR personnel assistance. All fires will be reported via radio to Imperial County Dispatch by calling 9-1-1.

11.3 Worst Case Scenario

The worst-case scenario was predicted in our model (see Section 10.2). Given the current vegetation type and distribution, the model shows that only 25% of the range is burnable. During dry, hot conditions, though a fire can move relatively quickly through vegetation on the range, little, if any, of the expected fire would exceed what a hand crew or dozer crew can handle. In addition, because the burnable vegetation distribution is scattered, with unburnable ground between clumps, a fire is unlikely to spread very far.

At worst, localized areas will experience a loss of vegetative cover that could take years to restore due to low annual precipitation, leading to a potential for some soil erosion and a possible vegetation type change (if invasive species get established). A vegetation restoration program would help quicken restoration and stabilize soils.

12.0 NATURAL AND CULTURAL RESOURCE CONSIDERATIONS CHECKLIST

Before any major action on federal lands is implemented, the NEPA requires federal agencies to consider environmental impacts of that action. NEPA applies to the approval of this plan.

The following sections briefly addresses each potential impact that implementing this plan may have on the CMAGR's environment.

12.1 Soils

Based on the fire behavior results presented in Section 10 of this document, the areas predicted to burn support vegetation types: North American Warm Desert Riparian Herbaceous, Sonoran Paloverde-Mixed Cacti Desert Scrub, and Sonora-Mojave Creosotebush-White Bursage Desert Scrub. These in turn are supported by two soil types: Tecopa-Rock Outcrop-Lithic Torriorthents and Vaiva-Rock Outcrop-Quilotosa-Laposa. According to the CMAGR's INRMP, these two soil types have a water erosion hazard of slight and slight to moderate, respectively.

Fire effects soils most when there is a high fuel buildup, leading to a longer residence time of the fire, leading to elevated heating of the soil. Also, if soil moisture is moderate to high, then that heat can permeate into the soil profile. However, desert soils typically support low fuel mass and low soil moisture, which is the case throughout the CMAGR. Because of this, during normal dry conditions, it is expected that any wildfire will not contribute significantly to subsequent soil erosion potential.

12.2 Climate

CMAGR is located in the drier part of the Sonoran Desert. The area is an arid, upland desert climate, characterized by hot days with cool nights and low humidity. As noted in Section 2.4, July is the hottest month (average maximum temperature of 104.9 degrees Fahrenheit (°F) (40.5 °C)), and January is the coolest month (average maximum temperature of 64.4°F (18°C)) (DoN, 2010) (WRCC 2011). Average precipitation measured at the Eagle Mountain meteorological station is 3.67 inches per year.

The driest months occur between the months of April through June. August is the wettest month due to the influence of the summer monsoon rain pattern (DoN, 2010).

While the hot, dry conditions support fire behavior, the arid conditions limit vegetation growth. A wildfire can contribute to vegetation-type change, especially in the presence of invasive species.

12.3 Hydrology

All of the surface drainage at CMAGR is internal; most run-off flows inward to 14 playas (sandy beach). According to the INRMP, here are two major watersheds consisting of playas, dry washes, seeps, springs and man-made water bodies. Surface water is ephemeral and flows seasonally, discharging to the Salton Sea, and Colorado River.

Nearby permanent water sources outside the CMAGR include the Salton Sea, New River, Alamo River, and Colorado River, (which includes the Coachella Canal). All except the Colorado River are largely sustained by irrigation return flows (DoN, et al., 2013).

There is no recorded fire history for the CMAGR, so it is difficult to assess how a wildfire might impact the area's hydrology. Because our predictive model indicates so little fire behavior activity within the range, it can be assumed that little to no impact on the hydrology will occur from wildland fire.

12.4 Vegetation

The four major vegetation types found on the CMAGR are: Lower Bajada and Fan Mojavean-Sonoran Desert Scrub, Madrean Warm Semi-desert Wash Woodland/Scrub, North American Warm Desert Bedrock Cliff and Outcrop, and Shadscale-Saltbush Cool Semi-desert Scrub. The vegetation found on the CMAGR is described in detail in Section 2.4.3.

12.5 Wildlife

The types of wildlife found in the CMAGR are typical fauna of the Sonora Desert. Although large vertebrates such as coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), and bobcat (*Lynx rufus*), are established within the range, the greatest diversity of wildlife is found among the small vertebrate and invertebrate residents. Birds and reptiles make up the greatest amount of vertebrate wildlife species found on the range.

Wildfires in the desert are increasingly changing the ecosystem. Wildfires not only kill wildlife, they also alter their habitat by changing the structure of the vegetation, enhancing erosion, and destabilizing soils (e.g., collapsing burrows). However, fire is expected on only 25% of the range and of that, the majority is predicted at low to moderate fire behavior. It is not anticipated that wildlife habitat will be significantly altered by wildland fire.

12.6 Threatened and Endangered Species

There are several sensitive, resident species in the CMAGR. The desert tortoise (*Gopherus agassizii*), protected under the Endangered Species Act, is a "threatened" species, and was listed in 1990. Approximately half the CMAGR, largely at higher elevations, is mapped as "High" quality tortoise habitat. Couche's Spadefoot (*Scaphiopus couchii*) is a California Species of Special Concern and is considered a Sensitive Species by the BLM (although this designation does not confer federal listing status). Nelson's desert bighorn sheep (*Ovis Canadensis nelsonii*) is also considered a Sensitive Species by BLM but has no designated CDFW or USFWS status. American Badger (*Taxidea taxus*) is a California Species of Special Concern but has no federal special status.

The number of species that are protected by state and federal designations occurring within the CMAGR are several, and include three reptiles, seven birds (in addition to the protection afforded by the Migratory Bird Treaty), seven mammals (five of which are bats), and 21 plant species (US Marine Corps Air Station Yuma Range Management Department and Naval Facilities Engineering Command, Southwest. 2017).

Just as the USFWS 1996 Biological Opinion for the Desert tortoise states that CMAGR activities would not jeopardize the desert tortoise or result in significant destruction or adverse modification of its critical habitat through its activities, a possible small, low-intensity wildfire is not likely to impact its habitat, nor would the limited suppression activity associated with the wildfire.

12.7 Air Quality

Implementing Air Pollution Abatement Procedures reduces CMAGR's contribution to the overall air pollution in Southern California. Per the Environmental Protection Agency (EPA 2015), the CMAGR is considered in a nonattainment area for particulate matter (PM₁₀), and O₃ precursors (EPA 2018).

Depending on wind direction, the CMAGR can be greatly affected by the transport of emissions from the Los Angeles Air Basin, home of the South Coast Air Quality Management District (SCAQMD) and from across the national border with Mexico; thus abatement will depend heavily on emission decreases in other areas. Regardless, "reasonable controls" for non-tactical activities on the CMAGR may be required by MCAS Yuma.

No prescribed fires will be conducted, and no wildfires are expected on the CMAGR. In addition, no training exercises will use or develop smoke. The EPA and the CARB require smoke management planning to control any emitting sources. This is accomplished through issuance of 'Permits to Operate and Training Burn Requests', which control actions involving burning operations. The CMAGR is required to control emissions through various emissions reduction techniques, through proper periodic maintenance, and through permitted operations, within meteorological (weather) constraints, that restrict the operating hours and fuel use.

12.8 Cultural Resources

The same factors that have helped to preserve the natural resources of the CMAGR—exclusion of surface disturbing, non-military land uses and correspondingly limited land surface disturbance by military activities—have also helped to protect cultural resources. As a result, well-preserved cultural resources within the CMAGR provide a record that tells of thousands of years of human habitation and use of this region.

These resources include both prehistoric and historic sites and features. Prehistoric sites include petroglyphs, bone scatters, ceramic scatters, cleared areas, rock circles, rock alignments, lithic scatters, fire altered rock, trails, and cairns. Historical sites include water diversion features, military trails, military roads, quarries, can scatters, glass scatters, cairns, and a railroad.

Because many of these cultural resources are not combustible and no large fuel buildups are known within the range, any wildfire activity is not expected to impact these cultural resources. However, wildfire suppression activity, as unlikely as it may be, may accidentally disturb or damage cultural resources.

In order to minimize the effects of any unlikely fire suppression activities, it is recommended that CMAGR adopt MIST as its primary means to fight fire. There are many actions that will help protect

cultural resources from the effects of fires. However, fire suppression activities, including ground disturbance and the use of aerial retardants, can have adverse effects, including damage to or destruction of prehistoric and historical period cultural resources. The effects of fire suppression activities and protection must be weighed against the potential for loss of cultural resources due to fire.

Ground disturbance includes construction of fire breaks (hand and mechanical construction), use and alteration of roads, establishment of the command post, fire camps, and helicopter landing pads. The use of fire trucks, bulldozers and heavy equipment on roads requires oversight to ensure that cultural resources are not adversely affected. Roads should be used as firebreaks if possible. Fire engines should be used on established roads only.

Emergency fire suppression may occur in areas where cultural resource surveys have not been completed and there is the potential for undetected cultural resources. Bulldozers or heavy equipment use and construction of fire breaks in un-surveyed areas should be coordinated with cultural resource staff. In some cases, an archaeologist may need to survey some areas ahead of fire suppression activities.

Application of fire retardants and other chemical agents, such as long-term retardants, foam, and water enhancers, have the potential to affect cultural resources. Aerial drops of any fire retardants on hot surfaces may cause effects to cultural resources due to rapid temperature change. These retardants may cause breakage or displacement of artifacts and features. Long term retardants are the most destructive, with additives that cause most materials to turn red and metal to turn blue or black. These desiccants damage rock images, rock shelters, and historical period buildings, structures, and materials. The CMAGR should specify “fugitive” retardant, which has no color. If the colored fire retardant is used, the retardant should be wiped off as soon as possible.

12.9 State and Local Considerations

No emissions from wildfire or related training activities is anticipated. Responsibility for air quality related to open burning in California has been delegated to the counties. Counties are responsible for issuing permits, defining conditions when burning will be permitted, and determining what materials may be burned. The range is situated in both Riverside County and Imperial County.

13.0 OTHER CONSIDERATIONS

13.1 Mission Impact Considerations

There are both direct and indirect effects of wildland fire on the military mission. Direct effects are the loss of military training during a wildfire. Fire carries economic costs for firefighting and loss of property. There are also direct and indirect effects on natural resources. The immediate loss of vegetation may appear to be a minor effect; however, changes in plant communities caused by alien plants and recurrent fire may alter habitat structure and composition of native animals' food plants (Brooks and Esque, 2002). The repeated loss of vegetation will also alter the landscape and intensify the magnitude of flooding events.

While these effects are real, on the CMAGR, they are also unlikely. Historical records show no significant fires have been reported on the range. In addition, predictive models confirm that 75% of the range is unburnable.

13.2 Monitoring Requirements

The main environmental concern that will be evaluated is the effect fires have on desert tortoise populations and their habitat. In addition, any burned area will be evaluated and monitored for invasive species establishment. Rehabilitation of these areas will happen on a site-specific basis. Seeding the area using native vegetation will assist with invasive species control. Site monitoring will help ensure the establishment of native species.

In years where rainfall is exceedingly plentiful, the quantity and continuity of fuels should be evaluated via an aerial/remote sensed survey. Data from weather stations should be analyzed to determine ignition and spread potential.

13.2.1 Reporting of Wildland Fires

See above for fire detection.

13.2.2 Emergency Stabilization, Rehabilitation and Restoration

This plan does not foresee a need for emergency stabilization, rehabilitation and restoration in light of the rare frequency, and insignificant areal extent of wildland fires.

13.3 Public Relations

The CMAGR is closed to the public. However, in the unlikely event of a wildland fire where public information coordination is needed, it will be reported to the Public Affairs Office (PAO) at MCAS Yuma: 928-269-2275. The PAO can assist with press, community relations, media relations, and more.

14.0 FUNDING REQUIREMENTS

The additional costs related to wildland fire management activities is negligible, due to the lack of a need for fire prevention, public education and outreach, training, inspection and preparedness, and wildland fire suppression itself. Costs to suppress wildfires are covered under the mutual aid agreement attached. A minor additional cost would be incurred for staff time to develop cooperative agreements and to analyze weather data for fire behavior analysis, and to conduct an aerial/remotely sensed survey of fuels when rainfall is particularly plentiful. Staff time will also be necessary to conduct joint training with ICFD regarding unexploded ordnance. Should funds be required, they would be requested by the Installation through the normal fiscal processes.

15.0 NATIONAL ENVIRONMENTAL POLICY ACT PROCESS FOR WFMP IMPLEMENTATION

Actions proposed in any IWFMP may constitute a major federal action as defined in 40 CFR Part 1508.18 (b) (2). Major federal actions must be evaluated for potential environmental effects. The NEPA document conducted for the installation INRMP may also include and provide analysis of the IWFMP. This IWFMP does not anticipate significant effects of the implementation of this plan.

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APPENDIX A. MUTUAL AID AGREEMENT BETWEEN IMPERIAL COUNTY FIRE DEPARTMENT AND MCAS YUMA (2016)

MUTUAL AID AGREEMENT

FOR

FIRE AND RESCUE SERVICES WITHIN IMPERIAL COUNTY FOR EXTRAORDINARY EMERGENCY SERVICES

This agreement made and entered into this 1st day of January 2016 by and between the County of Imperial, California; and Marine Corps Air Station (MCAS), Yuma, Arizona; pursuant to 42 U.S.C. 1856a and DoDI 6055.06, shall serve as the agreement between the parties for mutual aid fire protection and rescue services within Imperial County for extraordinary emergency services.

WITNESSETH:

WHEREAS, the lands or districts of the parties hereto are geographically located in the County of Yuma and the County of Imperial so that mutual assistance in an emergency situation is deemed feasible and desirable; and

WHEREAS, each of the parties hereto maintains equipment and personnel for the suppression of fires, the provision of emergency medical care and rescue services, and the stabilization and containment of other emergencies within their respective jurisdictions; and

WHEREAS, it is to the mutual advantage and benefit of each of the parties hereto to render supplemental fire suppression, prevention, protection and rescue services to each other in the event of an extraordinary emergency and to take part in joint training exercises;

WHEREAS, an extraordinary emergency service is that service which is not normally required for emergency service;

WHEREAS, the California Government Code Section 6500 and 42 U.S.C. 1856a encourages reciprocal agreements for providing mutual assistance fire protection and it is the policy of the Department of the Navy and of the municipalities, or other districts, and their governing bodies to conclude such agreements wherever practicable; and

WHEREAS, it is mutually deemed sound, desirable, practical, and beneficial for the parties to this agreement to render assistance to one another in accordance with the terms; and

WHEREAS, it is the desire of the signatories hereto to enter this Mutual Aid Agreement pursuant to the above authority on the terms and conditions herein contained.

THEREFORE THE PARTIES AGREE:

I. MUTUAL AND AUTOMATIC AID RESPONSE BY THE PARTIES

1. Mutual Aid. In the event of any extraordinary emergency occurring in any one of the signatory agencies' jurisdiction which for any reason

cannot be dealt with by that agency's personnel and equipment, than the other party to this agreement shall furnish to that signatory agency such fire suppression, prevention, protection and rescue services as may be reasonably required to cope with such emergency subject to the limitations hereinafter set forth in this agreement. The nature and extent of aid to be furnished shall be as determined by the Fire Chief of the signatory party from who such aid is requested based upon that party's availability of personnel and equipment. It is further expressly agreed that the aid actually furnished may be recalled at the sole discretion of the Fire Chief of the furnishing signatory party.

2. Automatic Aid. Due to Camp Billy Machen being located in Imperial County and its remoteness to MCAS Yuma Fire Department assets, the Imperial County Fire Department agrees to provide emergency response coverage for the facilities and personnel at Camp Billy Machen. Under terms of this agreement an automatic response means first response to an alarm within a specified area.

II. TERMS AND CONDITIONS OF RESPONSE

1. Supervision. Personnel who are furnished will work, as far as possible, at the direction of their supervisors and equipment furnished will ordinarily be operated by personnel of the party furnishing the equipment. General directions relative to the work will be given by the appropriate persons of the party receiving such aid. It shall be the responsibility of the party requesting assistance to ensure appropriate fire fighter safety and rehabilitation services are provided to all personnel involved in the emergency response, to include appropriate medical care, food, water, fuel and other logistical support as necessary.

2. State Emergencies. This agreement is intended to cover day-to-day mutual aid only and the automatic aid described above and shall be of no effect at times when the California Disaster and Civil Defense Master Mutual Aid Agreement becomes operative.

3. Local Obligations. It is mutually understood and agreed that this agreement does not relieve any of the parties hereto from the necessary obligation of providing adequate fire protection within its own jurisdiction. Each party hereto agrees that it shall use reasonable diligence in keeping its firefighting equipment in its possession up to adequate standards.

III. OTHER PROVISIONS

1. Service in the Line of Duty. In connection with this mutual aid firefighting assistance agreement, any service performed by Department of Defense personnel, civilian or military, shall constitute service rendered in the line of duty. The performance of such service by any other individual shall not constitute such individual as an officer or employee of the United States.

2. Confidential Information. In addition to Protected Health Information, as defined by the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and the Health Information Technology

for Economic and Clinical Health Act of 2009 (HITECT Act), during the course of performing this agreement, each organization may from time to time receive confidential information about the other including but not limited to information about the party's customers, patients, patient records, practices, procedures, strategies, organization, financial and other related information. Neither organization shall use or disclose any such confidential information for any purpose other than the limited purpose of performing its obligations under this agreement, without the prior express written permission of the supplying organization. All documents and records prepared maintained, handled or otherwise related to each organization's performance of services hereunder are and shall be the property of that organization.

3. Indemnification. Where a duty exists each party agrees to indemnify and save the other party harmless from any liability arising out of or resulting from the acts or omissions of that party's fire personnel during such times said personnel are serving in the jurisdiction of the other party for assistance, pursuant to the terms of this agreement.

4. Third Parties. This agreement shall not be construed as an agreement for the benefit of any third party or parties.

5. Points of Contact. Personnel responsible for the execution of this agreement are the Fire Chiefs of each respective jurisdiction. Reviews of this agreement are performed by the executing parties or their representatives. The MCAS Yuma Point of Contact for the administration of this agreement is the Support Agreement Manager (SAM). Any modification to the contents and conditions of the agreement must be facilitated through the SAM.

MCAS Yuma Fire Department
(928) 269-2887

County of Imperial Fire Department
(442) 265-6000

MCAS Yuma Support Agreement Manager
(928) 269-2047 / 269-3637

IV. PROVISIONS OF CLAIMS AND REIMBURSEMENT

1. Injuries. Any compensation required to be paid to any fire personnel, pursuant to 42 U.S.C 1856a and California Labor Code Section 4850, by reason of their injury occurring while their services are being utilized pursuant to this agreement, shall be the sole liability and responsibility of the party regularly employing such personnel.

2. Claims. Each party waives all claims against the other party for compensation for any loss, damage, injury, or death as a consequence of the performance of this agreement except those claims authorized by paragraph 3 below.

3. Additional Expenses. Direct expenses and losses which are additional firefighting costs over and above normal operation costs incurred while fighting a fire on property which is under the jurisdiction of the United States may be reimbursed in accordance with the Federal Fire Prevention

and Control Act of 1974 (Public Law No. 93-498, 15 U.S.C. 2201 et seq.) and its implementing regulation (44 C.F.R. 151).

V. TERMS OF AGREEMENT

This agreement shall become effective upon the date hereof and shall remain in full force and effect until cancelled by mutual agreement of the parties hereto, or by giving 30 days written notice to the other party of said cancellation. On the 31st day after notice, such withdrawal is effective. This agreement will be reviewed triennially by both parties. This agreement removes the County of Imperial as a party to the previously signed Mutual Aid Agreement between MCAS Yuma, the County of Imperial with the subject *Mutual Aid Agreement for Fire and Rescue Services within Imperial County of Extraordinary Emergency Service*, File#301 and effective date of 15 August 2000.

IN WITNESS WHEREOF, the parties hereto have executed this agreement on the day and year first above written.

COUNTY OF IMPERIAL
BOARD OF SUPERVISORS

By 
Chairman, Board of Supervisors

By 
Clerk of the Board of Supervisors

MARINE CORPS AIR STATION
YUMA, ARIZONA

By **MARTINEZ.RICARDO.1129087702**
DO.1129087702
Ricardo Martinez
Colonel, U.S. Marine Corps
Commanding Officer

Digitally signed by
MARTINEZ.RICARDO.1129087702
DN: c=US, o=U.S. Government, ou=DoD,
ou=PKI, ou=USMC,
cn=MARTINEZ.RICARDO.1129087702
Date: 2017.04.10 10:18:56 -0700

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